Appendix E

BIOLOGICAL TECHNICAL REPORT FOR THE PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

Palmdale Regional Groundwater Recharge and Recovery Project

Biological Technical Report

November 2015

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Palmdale Regional Groundwater Recharge and Recovery Project
Biological Technical Report

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1.0 INTRODUCTION

This Biological Technical Report presents the results of biological resources studies conducted by HELIX Environmental Planning, Inc. (HELIX) for the proposed Palmdale Regional Groundwater Recharge and Recovery Project (proposed Project). The studies were conducted to provide the Palmdale Water District (PWD), resource agencies, and the public with current biological data to satisfy review of the proposed Project under the California Environmental Quality Act (CEQA) and to demonstrate compliance with federal, state, and local regulations.

This report 1) describes the current biological conditions in the proposed Project impact area, which includes all areas that would be subject to direct, physical disturbance as a result of proposed Project implementation; 2) describes the vegetation communities/land uses and plant and animal species observed or detected during proposed Project surveys; and 3) identifies those resources that are sensitive. It also identifies sensitive species with potential to occur in the proposed Project impact area. Additionally, proposed Project impacts are assessed and mitigation is provided to offset the proposed Project's unavoidable, significant impacts to sensitive biological resources.

1.1 PROJECT LOCATION

The proposed Project is located generally in the northeastern portion of the City of Palmdale in Los Angeles County, California. Portions of the proposed Project would also be located within unincorporated Los Angeles County and the City of Lancaster (Figure 1). More specifically, the proposed Project is situated north of State Route 138, east of State Route 14, south of Edwards Air Force Base, and west of the community of Lake Los Angeles. The proposed Project is located in portions of the Alpine Butte, Lancaster East, Littlerock, and Palmdale United States Geological Survey (USGS) 7.5-minute quadrangle maps (Figure 2).

The proposed Project consists of several components at different locations, including a Recharge Site, a Distribution Site, a network of Recovery Wells surrounding the Recharge Site, and several associated pipelines. The Recharge Site is located south of East Avenue L, west of 105th Street East, north of Avenue L-8, and east of 100th Street East. The Distribution Site is located approximately 0.5 mile south of the Recharge Site's southern boundary. The Recovery Wells are located along side of East Avenue K-8, 110th Street East, East Avenue M, and 95th Street. The proposed Project also includes alignments for raw, potable, and recycled water supply mains that would be located mostly within existing streets. The pipelines are bounded by East Avenue K-8 to the north, the East Branch of the California Aqueduct to the south, 106th Street to the east, and 60th Street East to the west (Figures 2 and 3).

1.2 PROJECT DESCRIPTION

The PWD plans to develop groundwater banking programs with new spreading grounds to recharge imported water and recycled water, as well as recovery facilities to help meet future water demands and improve reliability. Water for groundwater recharge would be obtained from two sources: raw water from the East Branch of the California Aqueduct (State Water Project [SWP] water) and recycled water from the Los Angeles County Sanitation District's (LACSD's)

Palmdale Water Reclamation Plant. The SWP water would be the blending source for the recharge water. The recharge capacity of the proposed Project is estimated to be approximately 50,000 to 52,000 acre feet per year (AF/yr). For the magnitude envisioned for the proposed Project, SWP water would need to be recharged nearly year-round during wet years, which is estimated to occur approximately six out of every 10 years. During dry years (anticipated to be approximately four out of every 10 years), no SWP recharge would occur. Recycled water produced locally also would be included in the recharge (compliant with applicable regulations); this source is anticipated to be available at an approximately constant rate year-round.

The proposed Project would occur in phases. The preliminary phase is intended to meet PWD's water demands for the first 22 years of the proposed Project's life, providing a water supply of 14,125 AF/yr. The second phase is sized to meet the PWD's water demand through the 50-year proposed Project evaluation period (through 2067), as well as ultimate build-out, providing a water supply of up to 24,250 AF/yr. If a partner agency joins PWD, up to 30,000 AF/yr could be pumped back to the SWP for use by the partner agency. The components of the proposed Project, which are each designed to accommodate the ultimate demand of the proposed Project, are listed below.

- **State Water Project (SWP) Turnout:** A new 50-cubic-feet/second (cfs) Turnout would be located at the intersection of the East Branch of the California Aqueduct and 106th Street East (Figure 3). A turnout at the East Branch of the California Aqueduct is a connection/gate that allows water to leave the aqueduct. The Turnout consists of a rectangular cutout of the East Branch of the California Aqueduct concrete canal lining, approximately 25 feet long by 10 feet wide. A trashrack and an algae screen would be installed over the cut-out section to prevent trash and algae from entering the Turnout. A 36-inch pipe would enter the side of the East Branch of the California Aqueduct. Water would flow into the pipe through a flow meter, then through the SWP/Raw Water/Return Water Pipeline to the recharge basins (both the pipeline and recharge basins are discussed in more detail below). The new Turnout structure would be composed of reinforced concrete. Stop logs and a motor-actuated sluice gate would control the flow entering the pipeline. The East Branch of the California Aqueduct would remain in operation during the construction of the SWP Turnout. A cofferdam would be used to provide a dewatered section of the East Branch of the California Aqueduct for construction activities. Water passing the cofferdam would have a slight increase in velocity due to the cross-sectional area restriction; however, this velocity increase should not impact East Branch of the California Aqueduct operations since the bottom and side slopes are lined with four inches of concrete. Once construction is complete, the cofferdam would be removed and water flow in the East Branch of the California Aqueduct would return to normal. Outdoor lighting would be provided at the Turnout for use during occasional maintenance activities. The lights would not normally be on; they would be turned on when needed for maintenance and would potentially have lockable light switches.

- **Recharge Site:** The Recharge Site is 160 acres and is defined by East Avenue L to the north, East Avenue L-8 to the south, 100th Street East to the west, and 105th Street East to the east (Figure 3). The basins at the Recharge Site would consist of four 20-acre cut-and-fill earth embankment recharge basins with shotcrete interior slopes. The side

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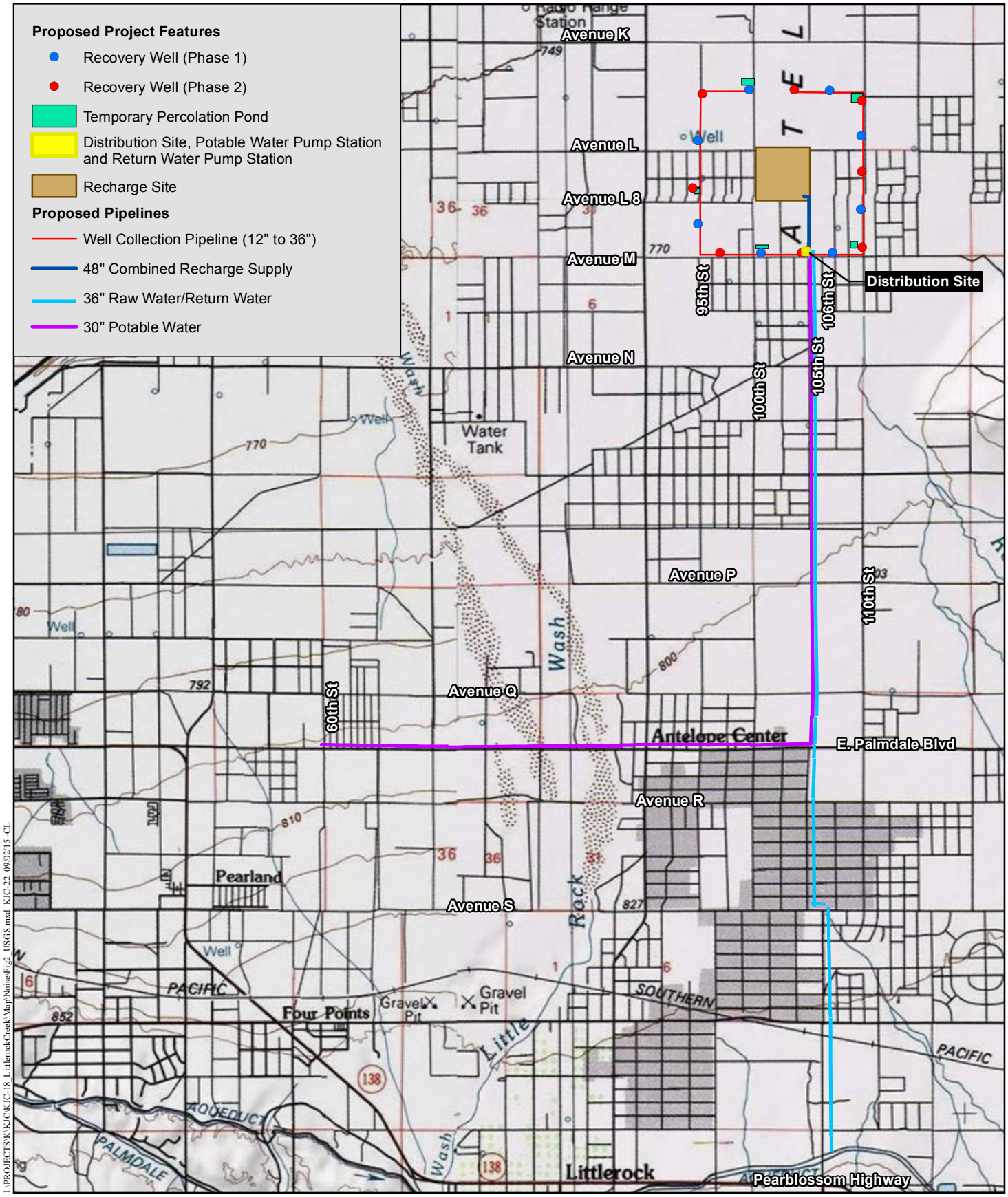
Regional Location Map

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

N 0 10 Miles

Figure 1



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Project Vicinity (USGS Topography)

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

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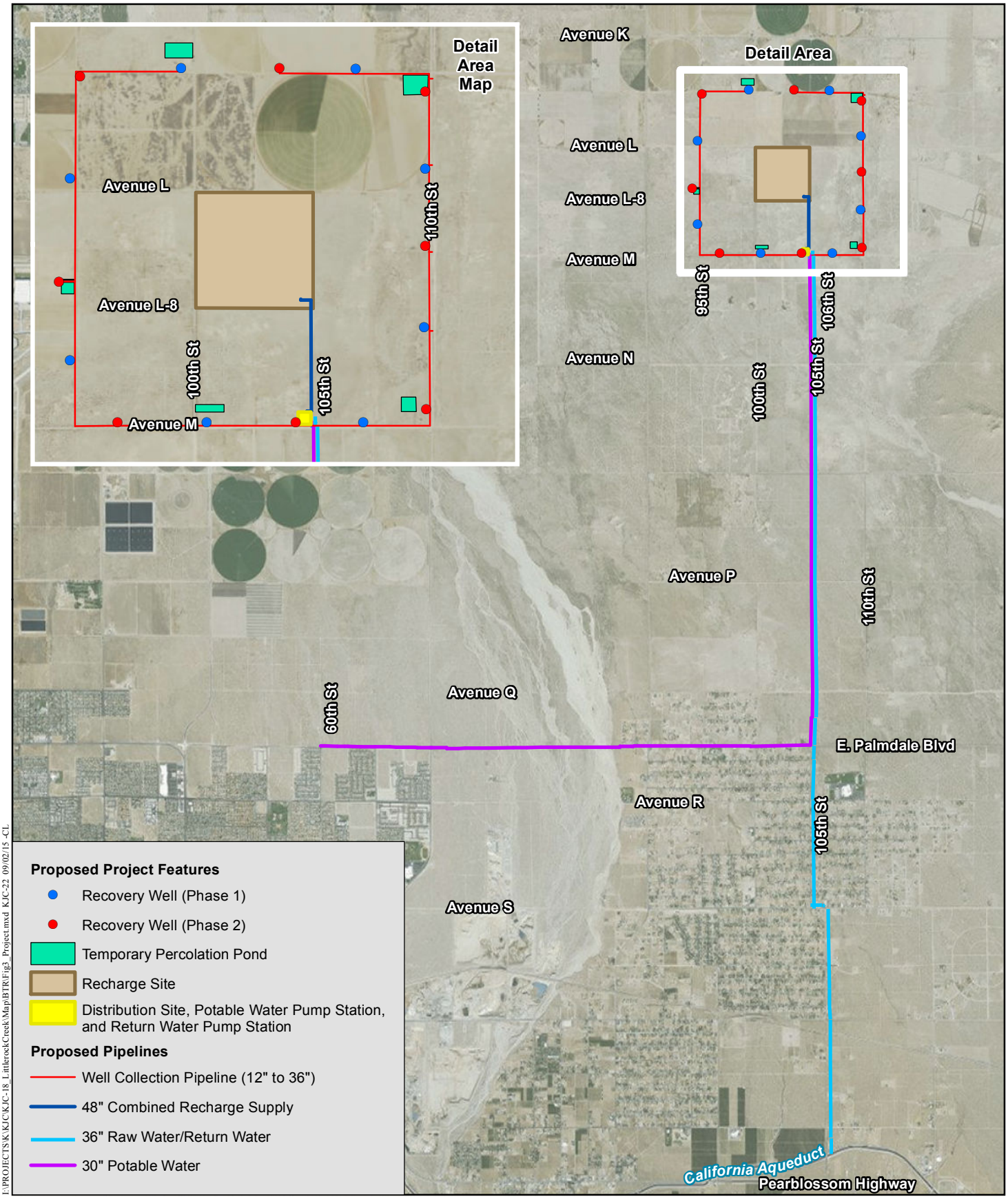
Figure 2



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Proposed Project - Aerial Photograph

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

N 0 6,500 Feet

Figure 3

slope of the recharge basin embankments would be 3:1, with a maximum height of approximately eight feet. The recharge basins would be tilled/scarified every two years, on average. Soils removed from the recharge basins would be stockpiled on an approximately 10-acre portion of the Recharge Site, outside of the fenced 110-acre portion of the site (see next paragraph for fencing description) and would be subject to standard measures to control dust. The basins would normally always receive at least some recycled water; therefore, at least one basin of the four would receive recharge water and be partially or completely full (depending on the recharge rates). Basins with recharge water in them would maintain a depth of three to four feet. The shotcrete slopes, water depth, and tilling/scarifying would help prevent the development of wildlife habitat in and around the basins. Basins that are in drying cycles would drain the bottom approximately one foot of water to the next lower basin to accelerate the drying and maintenance process. These operational procedures may change seasonally from wet winter months to dry summer months with shorter drying cycles required during hot summer months.

The basins would occupy approximately 80 acres in the center of the 160-acre Recharge Site and would be surrounded by an eight-foot-high chain-link security fence topped with three-strand barbed wire. The fenced area would include the recharge basins and the sloped berms surrounding the basins, covering approximately 110 acres of the 160-acre site. Approximately 40 of the 50 acres outside of the 110-acre fenced area containing the recharge basins would be partially disturbed during construction activities on the inner 110 acres, but the impacts would be temporary and would not occur over all 40 acres. The remaining 10 acres of the 50-acre area would be utilized for long-term soil stockpiling associated with basin maintenance. Following construction of the recharge basins and associated structures, with the exception of the access road from the Distribution Site to the Recharge Site (Figures 2 and 3) and the approximately 10-acre portion to be utilized for soil stockpiling, the area outside of the fenced recharge basins would be allowed to revegetate naturally and would remain unused. The PWD would conserve approximately 40 acres of this unfenced portion of the Recharge Site in a conservation easement, restrictive covenant, or other legal protective mechanism.

Outdoor lighting would be provided at each of the recharge basins (one on each inlet and outlet for a total of eight) for use during occasional maintenance activities. The lights would not normally be on; they would be turned on when needed for maintenance and would potentially have lockable light switches

- **Raw Water/Return Water Conveyance:** The Raw Water/Return Water Pipeline is approximately 8.6 miles in length and would connect the Recharge Site with the East Branch of the California Aqueduct at the proposed SWP Turnout described above (Figure 3). The 36-inch diameter Raw Water/Return Water Pipeline would travel north along 106th Street East from the SWP Turnout for approximately 2.3 miles. It would then traverse west along East Avenue S for approximately 0.1 mile, and then north along 105th Street East for approximately 1.5 miles to the terminus of 105th Street East at East Palmdale Boulevard. The Raw Water/Return Water Pipeline would continue north from the intersection of 105th Street East and East Palmdale Boulevard, along the future

105th Street East alignment through undeveloped land for approximately 4.7 miles to connect with the recharge basins at the Recharge Site.

- **Recycled Water Pipeline:** The Recycled Water Pipeline includes the construction of a 30-inch pipeline that would connect to an existing 48-inch recycled water pipeline at the intersection of 105th Street East and East Avenue M (Figure 3). The proposed 30-inch pipeline would traverse north and west for approximately 0.1 mile along 105th Street East, paralleling the 36-inch Raw Water/Return Water Pipeline, until reaching the Distribution Box at the Distribution Site (Distribution Site is discussed in more detail below).

- **Recovery Wells:** The proposed Project would include 16 Recovery Wells occurring in two phases, with all Recovery Wells having an estimated capacity of 1,200 gallons per minute (gpm). The Recovery Wells are intended to be phased one-half at a time with eight Recovery Wells installed during the preliminary phase, and eight Recovery Wells installed in the second phase. The Recovery Wells would be configured surrounding the Recharge Site, located on an approximately 1.5-mile by 1.5-mile square, centered around the Recharge Site (Figure 3). The wells are set back a minimum of 0.5 mile on each side of the Recharge Site to provide more than one year of travel time, as required by the California Department of Drinking Water, for recycled water traveling from the recharge basins to the Recovery Wells. Four Recovery Wells would be located along 95th Street East between Avenue M and Avenue K-8; five Recovery Wells would be located along 110th Street East between Avenue M and Avenue K-8; three Recovery Wells would be located along Avenue K-8 between 95th Street East and 110th Street East; and four Recovery Wells would be located along Avenue M between 95th Street East and 110th Street East. One of the Recovery Wells located along Avenue M would be located within the fenced Distribution Site (Distribution Site is discussed in more detail below).

  All 16 Recovery Wells would be approximately 200 horsepower, housed in buildings, and would operate up to 97 percent of the year. Outdoor lighting would be provided at each of the Recovery Wells for use during occasional maintenance activities. The lights would not normally be on; they would be turned on when needed for maintenance and would potentially have lockable light switches. Approximately six miles of Well Collection Pipeline would connect the Recovery Wells to the Potable Water Pump Station (described below). The Well Collection Pipeline for the preliminary phase is sized to deliver water from the Recovery Wells in both phases to the Recharge Site and is located either in existing or future street alignments. The Well Collection Pipeline would vary in size, ranging from 12 inches at the north of the Distribution Site to 36 inches at the south of the Distribution Site.

  The proposed Project would also include five temporary percolation ponds on parcels in close proximity to Recovery Wells for water collection and percolation into the groundwater basin during Recovery Well testing. These parcels would be bermed using soil within each parcel and would temporarily store water pumped up during Recovery Well testing. The water would remain on each parcel until it has percolated back into the

groundwater basin. The soils forming the berms on each parcel would then be redistributed around the parcel.

- **Distribution Site:** The 1-million-gallon Storage Tank and Pump Station Building (with chlorination facilities) would be located on a 2-acre parcel approximately 0.5 mile south of the Recharge Site, at the northwestern corner of the Avenue M and 105th Street East intersection (Figure 3). A 48-inch Combined Recharge Supply Pipeline would convey water between the Distribution Site and the Recharge Site. This 48-inch Combined Recharge Supply Pipeline would be approximately 0.5 mile in length and would convey water from the Distribution Box at the pump station to the Splitter Box at the Recharge Site. An access road would connect the Recharge Site and the Distribution Site. Outdoor lighting would be provided at the Distribution Site and Splitter Box for use during occasional maintenance activities. The lights would not normally be on; they would be turned on when needed for maintenance and would potentially have lockable light switches

- **Potable Water Pump Station and Potable Water Pipeline:** The Potable Water Pump Station is intended to accommodate the ultimate demand. However, the pumps themselves are to be phased, meaning the four 3,000-gpm, 400-horsepower pumps (plus one additional pump as a spare) are intended to accommodate the 14,125 AF/yr demand, and the ultimate demand would be supplied through two additional pumps of the same size and capacity. Although most phasing for the proposed Project is intended to be within two parts, this Potable Water Pump Station is capable of being implemented through multiple phases as demand increases. The Potable Water Pump Station would be located on the same 2-acre parcel as the 1-million-gallon Storage Tank and Chlorination Room. The proposed Project would also include the installation of a 30-inch Potable Water Pipeline that originates at the Potable Water Pump Station and proceeds south along the same alignment as the Raw Water/Return Water Pipeline and then traverses west along East Palmdale Boulevard until 60th Street East. The Potable Water Pipeline would be approximately 9.2 miles in length. The Potable Water Pump Station would operate continuously to meet PWD's potable water demands. There would be a bathroom in the control room, which would require an on-site septic tank and leach field.

- **Return Water Pump Station:** The optional Return Water Pump Station is designed to accommodate a water banking partner or partners in order to pump-back to the East Branch of the California Aqueduct. The Return Water Pump Station would be located adjacent to the 1-million-gallon Storage Tank and discharge back into the 30-inch-diameter Raw Water/Return Water Pipeline. The Pump Station Building would house both the raw water and potable water pumps in a single building. It is not required for the Return Water Pump Station to be implemented until a water banking partnership is achieved. The Return Water Pump Station may be combined with the Potable Water Pump Station, resulting in a six-pump, 3,750-gpm, 600-horsepower pump station, with one additional pump as a spare. The Return Water Pump Station, if it is implemented, would operate the majority of the year for an anticipated four out of 10 years, which is the anticipated frequency of dry years.

The proposed Project also includes Project Design Features for construction and operation to avoid/minimize impacts to biological resources, as follows:

- During construction activities at the Recharge Site, Distribution Site, and Recovery Wells, limits of the proposed Project impact footprint will be clearly delineated with staking, orange construction fencing, and/or silt fencing, as appropriate, to avoid unauthorized impacts.

- Monitoring will be provided by a qualified biologist approved by PWD to ensure that all impacts occur within designated limits for work occurring at undeveloped portions of the proposed Project site (Recharge and Distribution Sites and Recovery Wells). Monitoring entails communicating with contractors, taking daily notes, and ensuring that the requirements of the mitigation measures are being met by being present during construction activities including all initial grubbing and clearing of vegetation.

- The qualified biologist will perform periodic inspections of construction (after grubbing and clearing of vegetation) once or twice per week depending on the sensitivity of the adjacent biological resources. The qualified biologist will send monthly monitoring reports to PWD. At the end of construction of each stage, the biologist will prepare a post-construction report for PWD that documents the as-built impacts of construction so that mitigation requirements can be revised accordingly, if necessary.

- Contractors, subcontractors, and their respective personnel will refer environmental issues including wildlife relocation, sick or dead wildlife, or questions about environmental impacts to the qualified biologist. Experts in wildlife handling may need to be brought in by the qualified biologist for assistance with wildlife relocations.

- All proposed Project construction and operation lighting will be of the lowest illumination possible for safety and security and shall be selectively placed, shielded, and directed away from adjacent sensitive vegetation outside the proposed Project impact area.

- Construction traffic and operational vehicular activity on unpaved access roads will not exceed a speed of 15 miles per hour.

2.0 ENVIRONMENTAL SETTING

2.1 PROJECT SETTING

The environmental setting for the proposed Project is generally described herein with respect to that which occurs within the boundaries of the proposed Project survey area. The proposed Project survey area covers all proposed Project features plus a 50-meter buffer and is the area within which most of the proposed Project biological surveys were conducted (see Section 4.0). The proposed Project is located within a relatively broad, alluvial plain and exhibits a generally level topographic profile. Elevations in the proposed Project survey area range from approximately 2,900 feet above mean sea level (amsl) near the proposed SWP Turnout, to

2,500 feet amsl in the vicinity of the Recharge Site. Surface drainage from most of the proposed Project survey area is via sheet flow and small, un-named ephemeral drainages that flow primarily north, as well as via a larger ephemeral drainage, Little Rock Wash (Figure 3).

Soils in the proposed Project survey area primarily include a variety of sands and sandy loams (U.S. Department of Agriculture Natural Resources Conservation Service [USDA NRCS] 2015). Generalized vegetation in the proposed Project area primarily consists of agricultural land and common desert scrub communities. Residential development occurs near the proposed Project at its southern and western-most ends along the pipeline routes (Figure 3).

3.0 REGULATORY CONTEXT

Biological resources in the proposed Project impact area are subject to regulatory administration by the federal government and State of California (State). The PWD is a special district; therefore, regional (e.g., West Mojave Plan) and local plans and policies (e.g., city and county plans) do not apply to the proposed Project. Nevertheless, these plans and policies were examined as part of the literature review for the proposed Project and are listed in Section 4.1.

3.1 FEDERAL

3.1.1 Endangered Species Act

The Federal Endangered Species Act (FESA) designates threatened and endangered animals and plants and provides measures for their protection and recovery. "Take" of federal listed animal species and of federal listed plant species in areas under federal jurisdiction is prohibited without obtaining a federal permit. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Harm includes any act that actually kills or injures fish or wildlife, including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife. Activities that damage the habitat of (i.e., harm) listed wildlife species require approval from the U.S. Fish and Wildlife Service (USFWS) for terrestrial species. The FESA also generally requires determination of critical habitat for listed species. If a project would involve a federal action potentially affecting critical habitat, the federal agency would be required to consult with the USFWS.

Federal Endangered Species Act (FESA) Section 7 and Section 10 provide two pathways for obtaining authority to take federal listed species. Under Section 7 of the FESA, a federal agency that authorizes, funds, or carries out a project that "may affect" a listed species or its critical habitat must consult with the USFWS. Under Section 10 of the FESA, private parties with no federal nexus (i.e., no federal agency will authorize, fund, or carry out a project) may obtain an Incidental Take Permit to harm listed species incidental to the lawful operation of a project.

3.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA; 16 U.S. Code Sections 703–711) includes provisions for protection of migratory birds, including the non-permitted take of migratory birds. The MBTA

regulates or prohibits taking, killing, possession of, or harm to migratory bird species listed in Title 50 Code of Federal Regulations Section 10.13. Migratory birds include geese, ducks, shorebirds, raptors, songbirds, and many others. Disturbance that causes nest abandonment and/or loss of reproductive effort (killing or abandonment of eggs or young) is considered a "take." The MBTA is an international treaty for the conservation and management of bird species that migrate through more than one country and is enforced in the United States by the USFWS. The MBTA was amended in 1972 to include protection for migratory birds of prey (raptors).

3.1.3 Clean Water Act (Section 404)

Under Section 404 of the Clean Water Act (CWA), the U.S. Army Corps of Engineers (USACE) is charged with regulating the discharge of dredge and fill materials into jurisdictional waters of the U.S. The terms "waters of the U.S." and "jurisdictional waters" have a broad meaning that includes special aquatic sites, such as wetlands. Waters of the U.S., as defined by regulation and refined by case law, include: (1) the territorial seas; (2) coastal and inland waters, lakes, rivers, and streams that are navigable waters of the U.S., including their adjacent wetlands; (3) tributaries to navigable waters of the U.S., including adjacent wetlands; and (4) interstate waters and their tributaries, including adjacent isolated wetlands and lakes, intermittent and ephemeral streams, prairie potholes, and other waters that are not a part of a tributary system to interstate waters or navigable waters of the U.S., the degradation or destruction of which could affect interstate commerce.

Section 401 of the CWA requires that any applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. must obtain a Water Quality Certification, or a waiver thereof, from the state in which the discharge originates. In California, the Regional Water Quality Control Board (RWQCB) and State Water Resources Control Board (SWRCB) issue Water Quality Certifications.

3.2 STATE OF CALIFORNIA

3.2.1 California Environmental Quality Act

Primary environmental legislation in California is found in the CEQA and its implementing guidelines (State CEQA Guidelines), requiring that projects with potential adverse effects or impacts on the environment undergo environmental review. Adverse impacts to the environment are typically mitigated as a result of the environmental review process in accordance with existing laws and regulations.

3.2.2 California Endangered Species Act

The California Endangered Species Act (CESA) established that it is State policy to conserve, protect, restore, and enhance State endangered species and their habitats. Under State law, plant and animal species may be formally designated rare, threatened, or endangered by official listing by the California Fish and Game Commission. The CESA authorizes that private entities may "take" plant or wildlife species listed as endangered or threatened under the FESA and CESA,

pursuant to a federal Incidental Take Permit if the California Department of Fish and Wildlife (CDFW) certifies that the incidental take is consistent with CESA (Fish and Game Code Section 2080.1[a]). For State-only listed species, Section 2081 of the CESA authorizes the CDFW to issue an Incidental Take Permit for State listed threatened and endangered species if specific criteria are met.

3.2.3 Native Plant Protection Act

Sections 1900–1913 of the California Fish and Game Code (Native Plant Protection Act; NPPA) direct the CDFW to carry out the State Legislature's intent to "…preserve, protect, and enhance endangered or rare native plants of this state." The NPPA gives the California Fish and Game Commission the power to designate native plants as "endangered" or "rare" and protect endangered and rare plants from take.

3.2.4 California Desert Native Plants Act

The California Desert Native Plants Act (Division 23 of the California Food and Agriculture Code) was established to protect California desert native plants from unlawful harvesting on both public and private lands. The act also provides information necessary to legally harvest native plants so as to ultimately transplant those plants with the greatest possible chance of survival. The Act further encourages public participation in implementing the safeguards established by this division and in evaluating the effectiveness and desirability of the safeguards.

3.2.5 California Fish and Game Code

The California Fish and Game Code provides specific protection and listing for several types of biological resources. Section 1600 of Fish and Game Code requires a Streambed Alteration Agreement (SAA) for any activity that would alter the flow of, change, or use any material from the bed, channel, or bank of any perennial, intermittent, or ephemeral river, stream, and/or lake (i.e., waters of the State). Typical activities that require an SAA include excavation or fill placed within a channel, vegetation clearing, structures for diversion of water, installation of culverts and bridge supports, cofferdams for construction dewatering, and bank reinforcement. Notification is required prior to any such activities, and CDFW will issue an SAA with any necessary mitigation to ensure protection of the State's fish and wildlife resources.

Pursuant to California Fish and Game Code Section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Raptors and owls and their active nests are protected by California Fish and Game Code Section 3503.5, which states that it is unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird unless authorized by the CDFW. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the MBTA (see Section 3.1.2). These regulations could require that construction activities (particularly vegetation removal or construction near nests) be reduced or eliminated during critical phases of the nesting cycle unless surveys by a qualified biologist demonstrate that nests, eggs, or nesting birds will not be disturbed, subject to approval by CDFW and/or USFWS.

3.2.6 Porter-Cologne Water Quality Control Act of 1970

The Porter-Cologne Water Quality Control Act of 1970 grants the SWRCB and its regional offices power to protect water quality and is the primary vehicle for implementation of the State's responsibilities under Section 401 of the CWA (see Section 3.1.3). The Porter-Cologne Act grants the SWRCB authority and responsibility to adopt plans and policies, regulate discharges to surface and groundwater, regulate waste disposal sites, and require cleanup of discharges of hazardous materials and other pollutants. Typically, the SWRCB and Regional Water Quality Control Board act in concert with the USACE under Section 401 of the CWA in relation to permitting fill of federal jurisdictional waters.

4.0 SURVEY METHODS

A number of different surveys have been conducted to document biological resources present in the proposed Project survey area including focused surveys for sensitive species. The surveys addressed in this report were conducted by HELIX in 2014 and 2015.

4.1 LITERATURE REVIEW

Prior to conducting field surveys, HELIX biologists conducted a thorough review of relevant maps, databases, and literature pertaining to biological resources known to occur in and near the proposed Project. Recent aerial imagery (Google 2014), topographic maps, soils maps (USDA NRCS 2015), and the National Wetlands Inventory (USFWS 2015) were reviewed to obtain updated information on the biological setting of the proposed Project. In addition, sensitive species and habitat databases were reviewed including the California Natural Diversity Database (CNDDB; CDFW 2015a-d), the California Native Plant Society (CNPS) Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2015), Calflora (2015), and regional lists produced by the USFWS. The pre-survey investigation also included a verification of whether or not the proposed Project falls within areas designated as final or proposed Critical Habitat for any federal listed threatened or endangered species.

HELIX also examined the following planning documents and municipal code as part of its literature review for biological resources since the proposed Project falls within the boundaries of these jurisdictions. The PWD, however, is a special district, and the proposed Project is not subject to the policies of these plans or to municipal code.

- County of Los Angeles General Plan (Los Angeles County 2014)
- Antelope Valley Area Plan (Los Angeles County Department of Regional Planning 2015)
- City of Palmdale General Plan (City of Palmdale 1993)
- City of Palmdale Municipal Code (Chapter 14.04; Joshua Tree and Native Desert Vegetation Preservation)
- City of Lancaster General Plan (City of Lancaster 2009)
- West Mojave Plan (Bureau of Land Management [BLM] 2005)
- Desert Renewable Energy Conservation Plan (California Energy Commission et al. 2014)

Nomenclature used in this report generally follows Holland (1986) and CDFW (2010) for vegetation communities, Baldwin et al. (2012) for plants, Collins and Taggart (2002) for reptiles, American Ornithologists' Union (2015) for birds, and Baker et al. (2003) for mammals.

4.2 GENERAL BIOLOGICAL SURVEYS AND HABITAT ASSESSMENTS

HELIX conducted a general biological survey for the proposed Project on June 18, June 19, and November 18, 2014 (Table 1). The survey was part of a constraints analysis that covered a number of potential recharge sites and pipeline routes. The survey included mapping vegetation communities/land uses, completing comprehensive lists of plant and animal species observed or detected, conducting habitat assessments for sensitive species, and identifying potential waters of the U.S. and waters of the State. In 2015, focused surveys for sensitive plant species, desert tortoise, Mohave ground squirrel, and burrowing owl (*Athene cunicularia*) were conducted (Table 1).

Table 1
SURVEY INFORMATION

SURVEY	DATE	PERSONNEL	TIME[1]	WEATHER CONDITIONS[1]	
				Start	Stop
General Biological	06-18-14 06-19-14 11-18-14	W. Larry Sward George Aldridge Jenna Hartsook	--	--	--
Sensitive Plant Species	04-15-15	W. Larry Sward George Aldridge	--	--	--
Burrowing Owl 1 of 4	04-13-15	Rob Hogenauer	1710-1900	Clear, 82 degrees Fahrenheit (ºF), wind 8-12 miles per hour (mph)	Clear, 75 ºF, wind 4-8 mph
	04-14-15	Rob Hogenauer Ben Rosenbaum	0600-1015	Clear, 52 ºF, wind 4-6 mph	Clear, 63 ºF, wind 12-16 mph
			1720-1930	Clear, 64 ºF, wind 10-14 mph	Clear, 61 ºF, wind 15-25 mph
	04-15-15	Rob Hogenauer Ben Rosenbaum	0610-1030	Clear, 46 ºF, wind 2-4 mph	Clear, 61 ºF, wind 8-12 mph
Burrowing Owl 2 of 4	05-20-15	Ben Rosenbaum Katie Bellon Talaya Rachels	0550-0900	Cloudy, 57 ºF, wind 3-5 mph	Mostly cloudy, 63 ºF, wind 3-5 mph
			1740-1900	Mostly clear, 70 ºF, wind 15 mph	Clear, 66 ºF, wind 15-20 mph
	05-21-15	Ben Rosenbaum Katie Bellon Talaya Rachels	0540-0745	Overcast, 49 ºF, wind 10 mph	Partly cloudy, 53 ºF, wind 10 mph
Burrowing Owl 3 of 4	06-10-15	Rob Hogenauer Ben Rosenbaum Katie Bellon	0545-0930	Mostly cloudy, 66 ºF, wind 3-5 mph	Clear, 77 ºF, wind 5-10 mph
	06-11-15	Rob Hogenauer	0545-0730	Clear, 64 ºF, wind 1-3 mph	Clear, 74 ºF, wind 1-3 mph

Table 1 (cont.)
SURVEY INFORMATION

SURVEY	DATE	PERSONNEL	TIME[1]	WEATHER CONDITIONS[1]	
				Start	Stop
Burrowing Owl 4 of 4	07-01-15	Rob Hogenauer	1745-2000	Partly cloudy, 88 ºF, wind 2-5 mph	Partly cloudy, 82 ºF, wind 2-5 mph
	07-02-15		0540-0830	Cloudy, 72 ºF, wind 3-5 mph	Partly cloudy, 81 ºF, wind 3-6 mph
Mohave Ground Squirrel Visual Survey of Recharge Site	04-15-15	Mike McGovern	3 hours	Mid to high 70s ºF	
Mohave Ground Squirrel Recharge Site Trapping Survey 1 of 3	04-15-15 through 04-19-15		Traps were checked at 3- to 4-hour intervals throughout the day and closed 1.5 hours before sunset.	Traps were opened only if the temperatures were between 50 ºF and 90 ºF, if the wind was not strong, and it was not raining.	
Mohave Ground Squirrel Recharge Site Trapping Survey 2 of 3	05-06-15 through 05-10-15				
Mohave Ground Squirrel Recharge Site Trapping Survey 3 of 3	07-03-15 through 07-07-15				
Mohave Ground Squirrel Visual Survey of Pipelines and Distribution Site	08-24-25		Morning	NA	NA
Mohave Ground Squirrel Visual Survey of Recovery Well Sites, Well Collection Pipeline, and Percolation Ponds	09-22-15		Morning	NA	NA

Table 1 (cont.)
SURVEY INFORMATION

SURVEY	DATE	PERSONNEL	TIME[1]	WEATHER CONDITIONS[1]	
				Start	Stop
Desert Tortoise	10-05-15	Ben Rosenbaum Talaya Rachels Katie Bellon Rob Hogenauer	0715-1700	Mostly clear, 52 ºF, wind 4 mph	Mostly cloudy, 64 ºF, wind 2-5 mph
	10-06-15	Ben Rosenbaum Talaya Rachels Katie Bellon	0730-1700	Partly cloudy, 50 ºF, wind 1-3 mph	Mostly clear, 75 ºF, wind 1-3 mph
	10-07-15	Ben Rosenbaum Talaya Rachels Katie Bellon	0720-1300	Clear, 57 ºF, wind 1-2 mph	Clear, 81 ºF, wind 1-2 mph
	10-27-15	Ben Rosenbaum Talaya Rachels	0710-1510	Partly cloudy, 46 ºF, wind 1-2 mph	Mostly cloudy, 81 ºF, wind 3-5 mph
	10-28-15	Ben Rosenbaum Talaya Rachels	0715-1045	Mostly cloudy, 63 ºF, wind 1-3 mph	Partly cloudy, 73 ºF, wind 2-5 mph

[1]Applicable to the focused animal species surveys.

4.3 VEGETATION COMMUNITY/LAND USE MAPPING

HELIX field-mapped the vegetation communities/land uses in the proposed Project survey area during the general biological surveys. Vegetation communities/land uses were mapped on aerial imagery with a scale of 1 inch equals 200 feet that was overlaid with the proposed Project survey area. The mapped vegetation was digitized for use with HELIX's Geographic Information System in order to produce report graphics and calculate the impacts to those communities/land uses using digital files of the proposed Project impact footprints provided by the proposed Project engineer. Figures 4a through 4y depict the vegetation communities/land uses that occur within the proposed Project impact area.

4.4 IDENTIFICATION OF POTENTIAL JURISDICTIONAL FEATURES

HELIX conducted an assessment of potential jurisdictional waters of the U.S. and waters of the State in the proposed Project survey area during the general biological survey. The assessment was conducted using a combination of a desktop analysis of the National Wetlands Inventory (USFWS 2015) and direct, on-the-ground searches for evidence of potential jurisdictional features such as streambeds, riparian vegetation, scour, and sediment sorting.

4.5 FOCUSED SPECIES SURVEYS

Focused surveys for species with potential to occur in the proposed Project survey area (as determined by the literature review and habitat assessments) were conducted for sensitive plant species, desert tortoise (federal and State listed threatened), Mohave ground squirrel (State listed threatened), and burrowing owl (federal Bird of Conservation Concern and State Species of Special Concern). The methods for each of these surveys are described below.

4.5.1 Sensitive Plant Species

HELIX conducted a focused sensitive plant species survey for the proposed Project on April 15, 2015 (Table 1) in the proposed Project survey area. HELIX looked for all sensitive species and especially those that were determined to have potential to occur during the literature review and habitat assessment surveys. HELIX also performed inspections for sensitive plant species and compiled botanical inventories during the general biological and burrowing owl surveys. Sensitive plant species include species that are listed as threatened or endangered by the USFWS; listed as threatened, endangered, or rare by the CDFW; and/or included in the CNPS' Inventory of Rare and Endangered Plants (2015). The survey was conducted by walking transects through the proposed Project survey area.

4.5.2 Desert Tortoise

The proposed Project is located in an area that has been modeled as being within the current range of the desert tortoise and as potentially having habitat to support desert tortoise (USFWS 2011a; it is also inside the desert tortoise survey zone established by the West Mojave Plan [BLM 2005; see Section 4.1 regarding the West Mojave Plan]). The USFWS requires protocol surveys for desert tortoise for projects that are within the range of the species and contain

suitable habitat (USFWS 2010). In the Mojave Desert, typical desert tortoise habitat consists of creosote bush scrub with a high diversity of perennials. Based on the vegetation mapping, it was determined that Mojave creosote bush scrub is present in the proposed Project survey area, and a protocol survey was conducted for the desert tortoise in accordance with the most current USFWS survey guidance (USFWS 2010) as follows.

The survey was conducted during one of the tortoise's most active periods (September through October) and when air temperatures were below 104 ºF. The survey was conducted in belt transects and included searching for all above-ground tortoises (both out of burrows and within burrows but still visible), as well as all tortoise sign (burrows, scat, carcasses, etc). The survey area for the desert tortoise survey was established in accordance with the most current USFWS survey guidance; however, private properties and unsuitable habitat (e.g., active agricultural land) were not included in the survey. Table 1 presents information for the desert tortoise survey.

4.5.3 Mohave Ground Squirrel

The Mohave ground squirrel is found in a variety of desert scrub habitats, including creosote bush scrub, which, based on the vegetation mapping, is present in the proposed Project impact area. The species often occurs in sandy soils in or near alluvial fans, but also in gravelly soils. The soils in the proposed Project survey area may be suitable for this species. The CNDDB records for this species occur approximately 0.5 mile west of the Recharge Site and approximately 0.5 mile east of the Raw Water/Return Water Pipeline.

The CDFW (2003) requires a trapping survey for the Mohave ground squirrel for projects that propose impacts to habitat with potential to support the species and are within or adjacent to the species' known range. Mohave ground squirrel biologist, Mike McGovern, Ph.D., conducted a visual survey of the Recharge Site to assess the habitat on that site and to look for Mohave ground squirrels. He determined that the Recharge Site contained potentially suitable habitat for the species and recommended trapping. He conducted a trapping survey on April 15 through April 19, May 6 through May 10, and July 3 through July 7, 2015 (Table 1). The trapping survey was performed over a representative grid covering potential habitat within the Recharge Site. The survey was conducted in accordance with the most current protocol prescribed by the CDFW (2003). The survey report can be found in Appendix A.

Dr. McGovern conducted a visual survey of the pipeline routes and of the Distribution Site on August 24, 2015 to assess habitat suitability for the Mohave ground squirrel. The Distribution Site was surveyed on foot. The pipeline routes were surveyed by driving the routes and stopping at various locations. In areas where there were no roads, the pipeline routes were surveyed on foot. In all incidences, notes of the soils and vegetation were taken, as well as photographs. It was determined that the habitats in these areas were not suitable to support the Mohave ground squirrel; therefore, trapping was not warranted over these portions of the proposed Project impact area (Appendix A).

Dr. McGovern also conducted a visual survey of the Recovery Wells, Well Collection Pipeline, and temporary Percolation Pond parcels on September 22, 2015 to assess habitat suitability for the Mohave ground squirrel. The Recovery Well sites, Well Collection Pipeline route, and

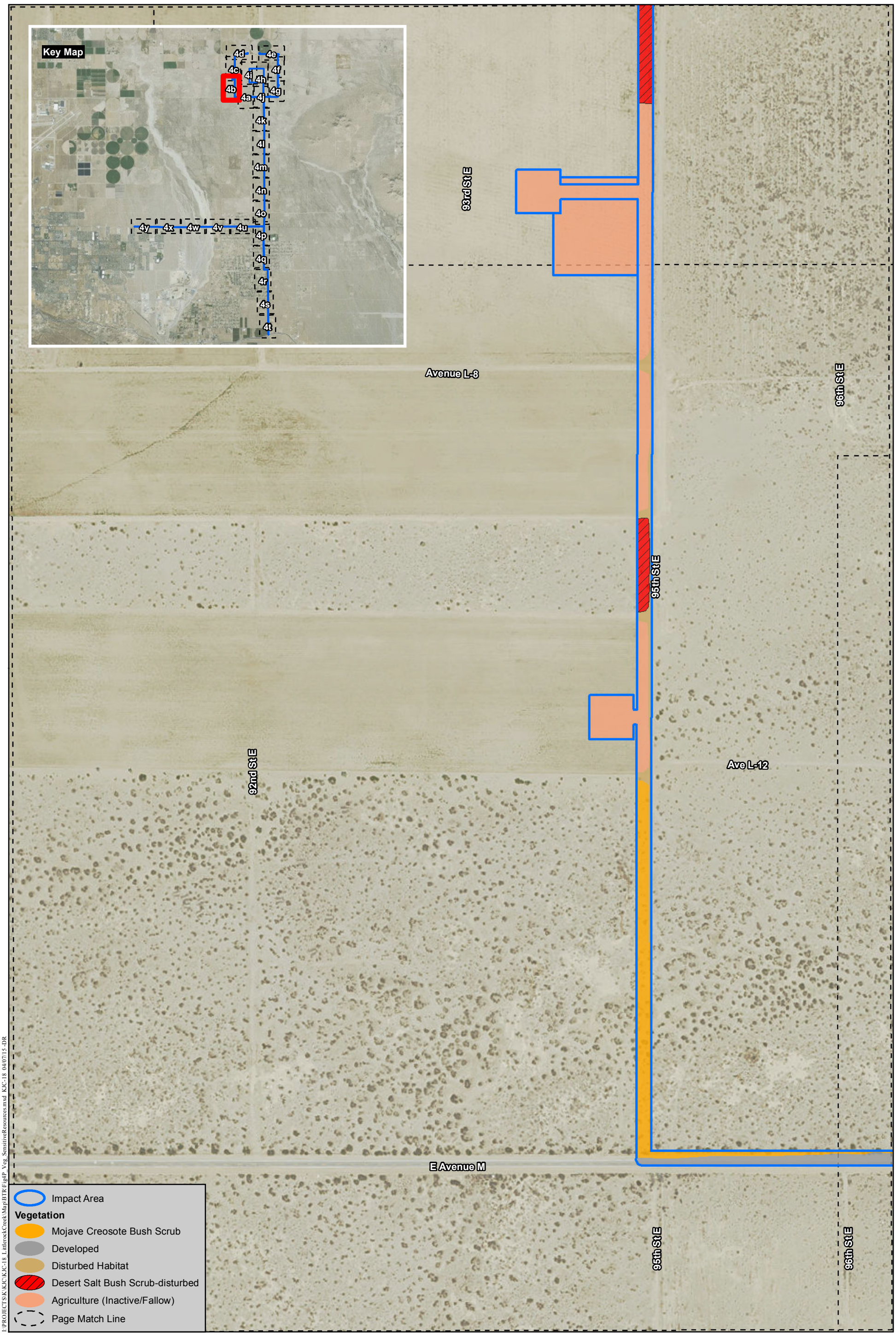
Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

0 300 Feet

Figure 4a

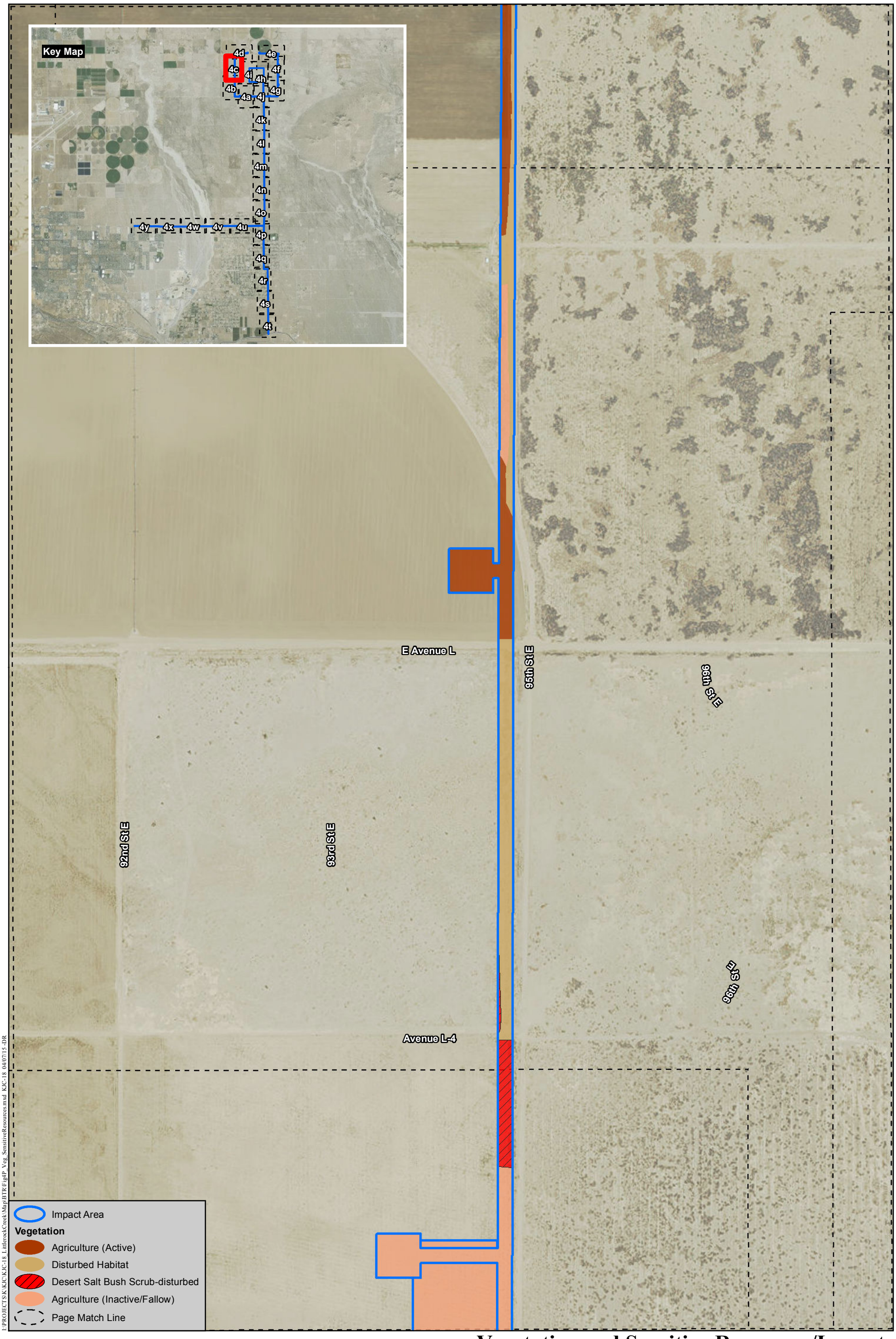


Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

Figure 4b



Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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Figure 4c

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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

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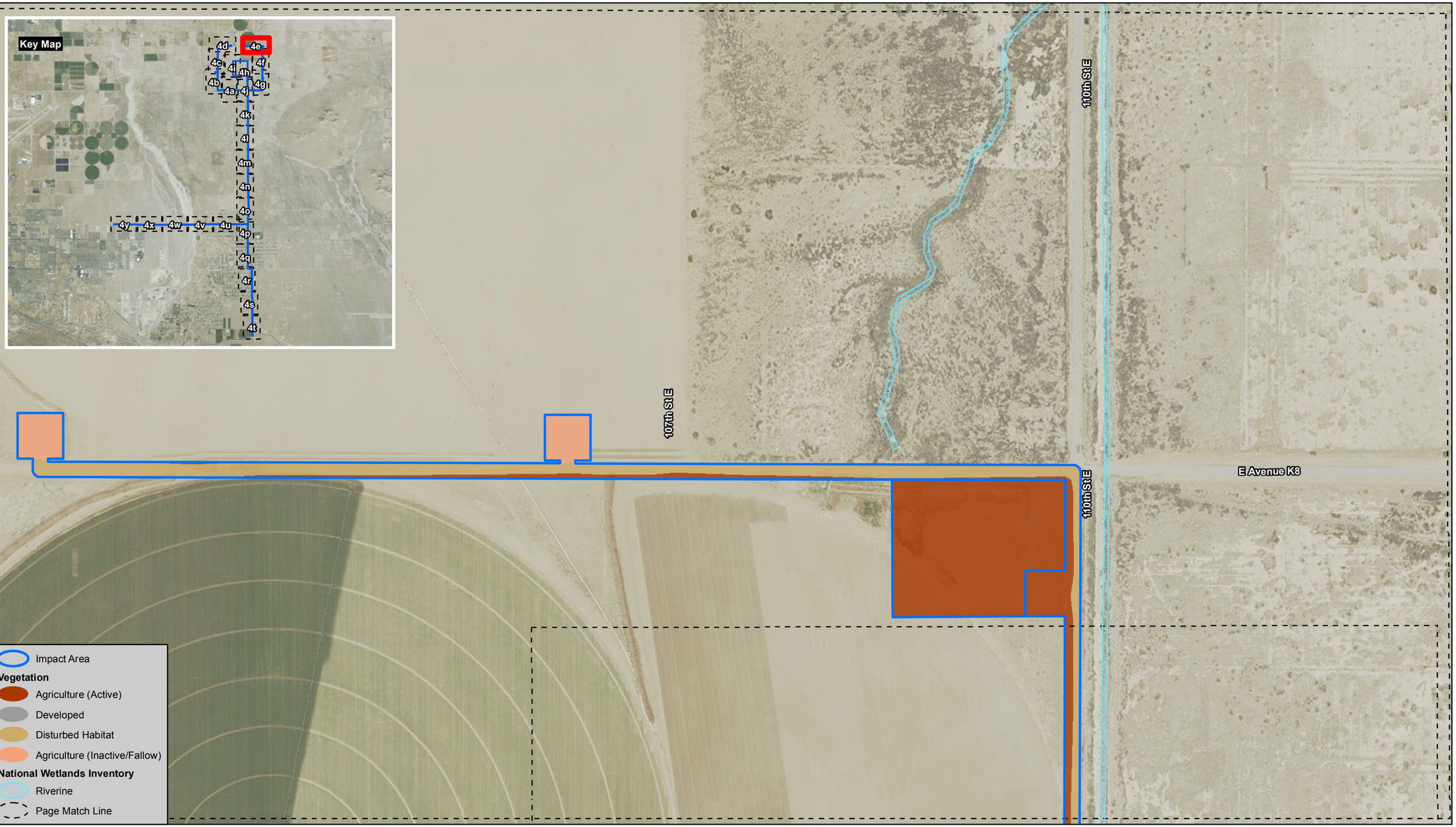
Figure 4d



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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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Figure 4e

Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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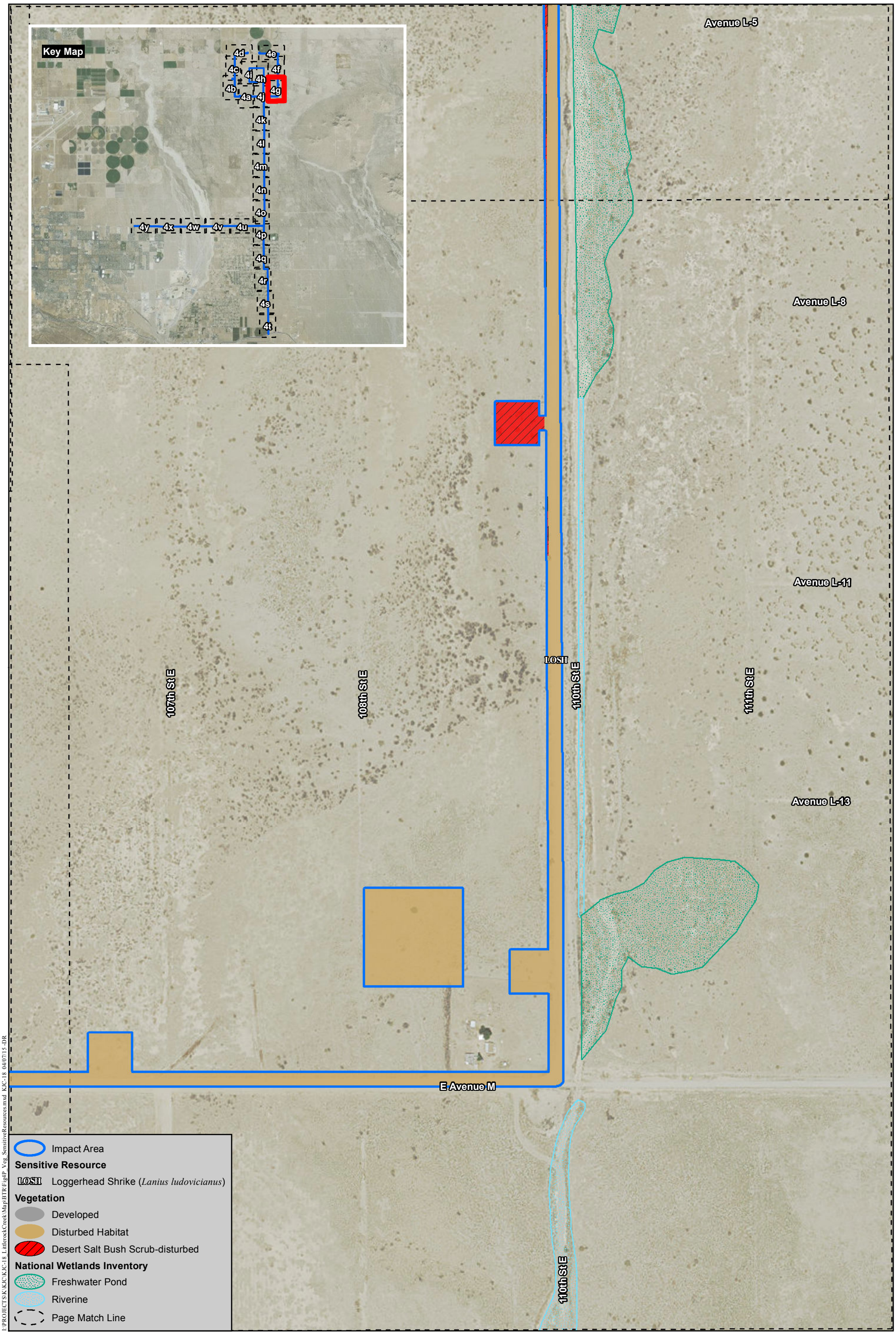
Figure 4f



Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

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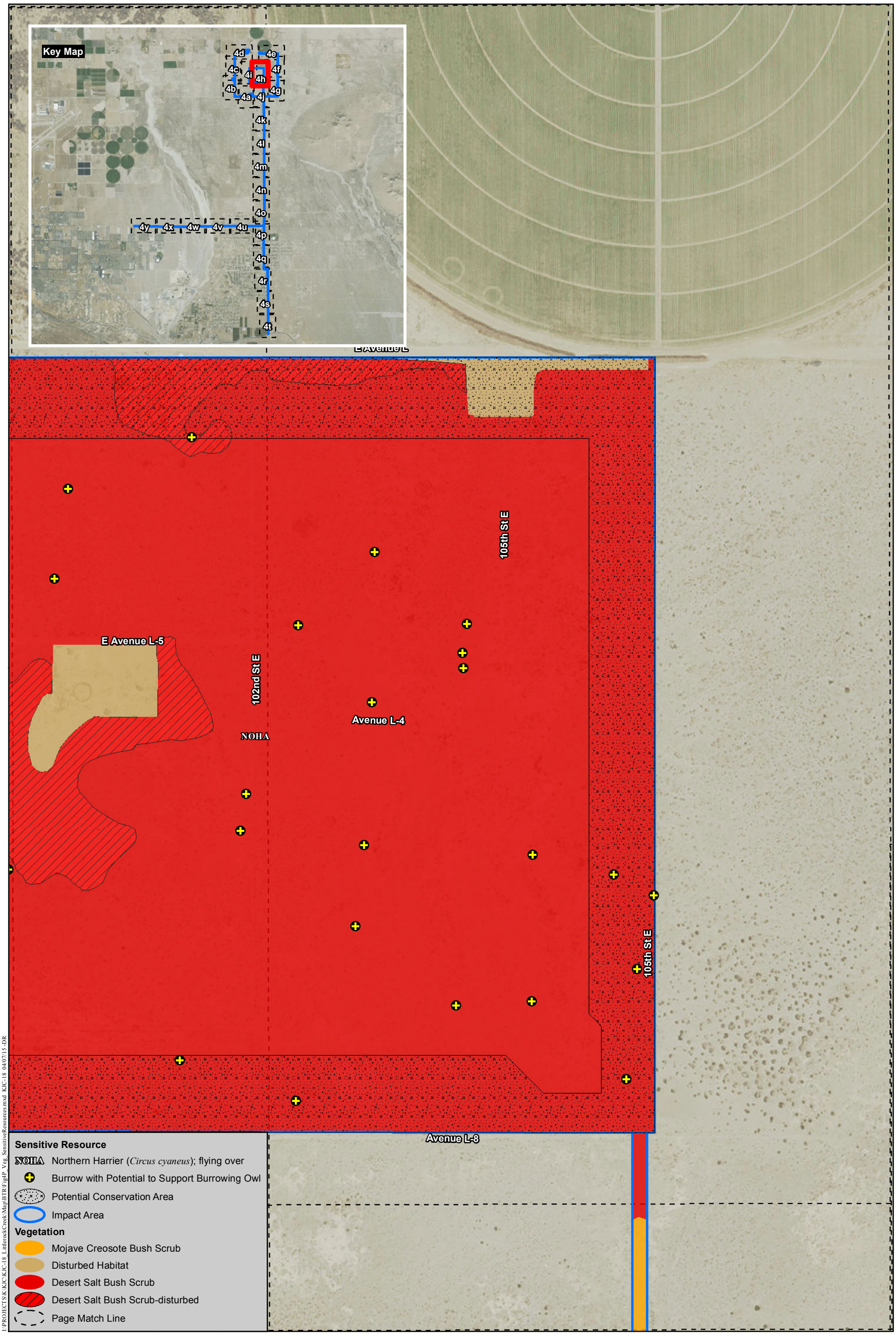
Figure 4g



Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

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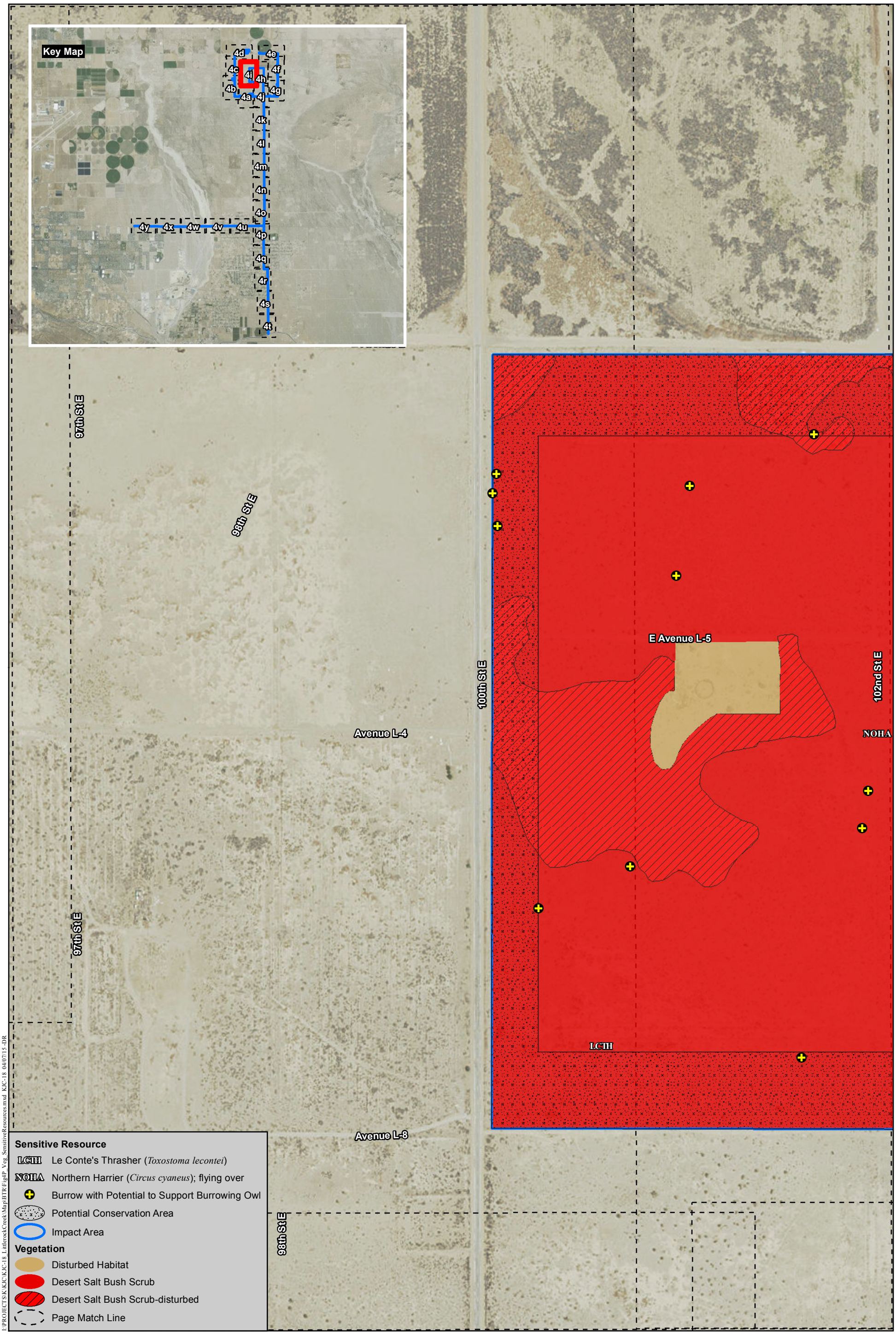
Figure 4h



Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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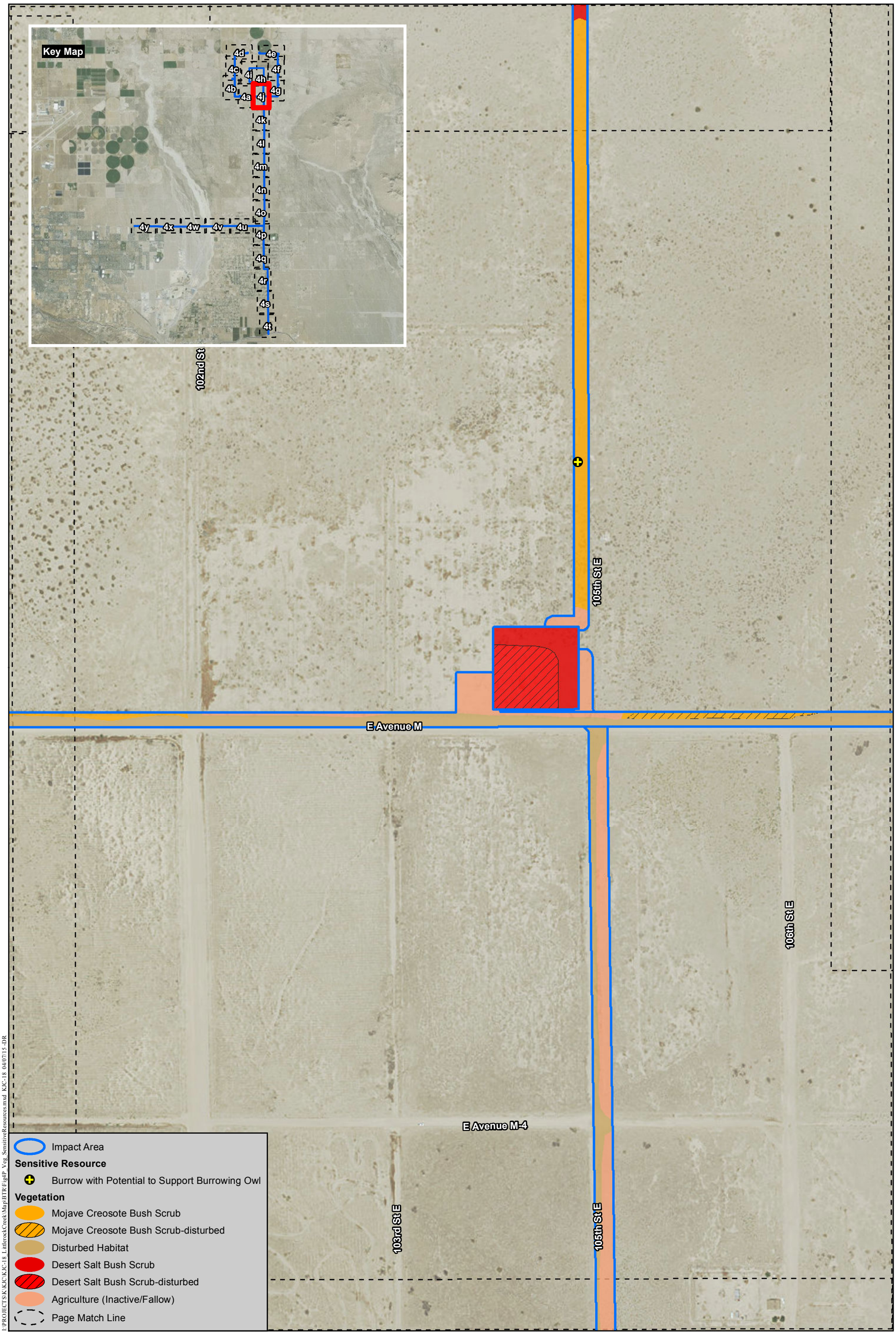
Figure 4i



Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

0 300 Feet

Figure 4j

Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

0 300 Feet

Figure 4k

Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

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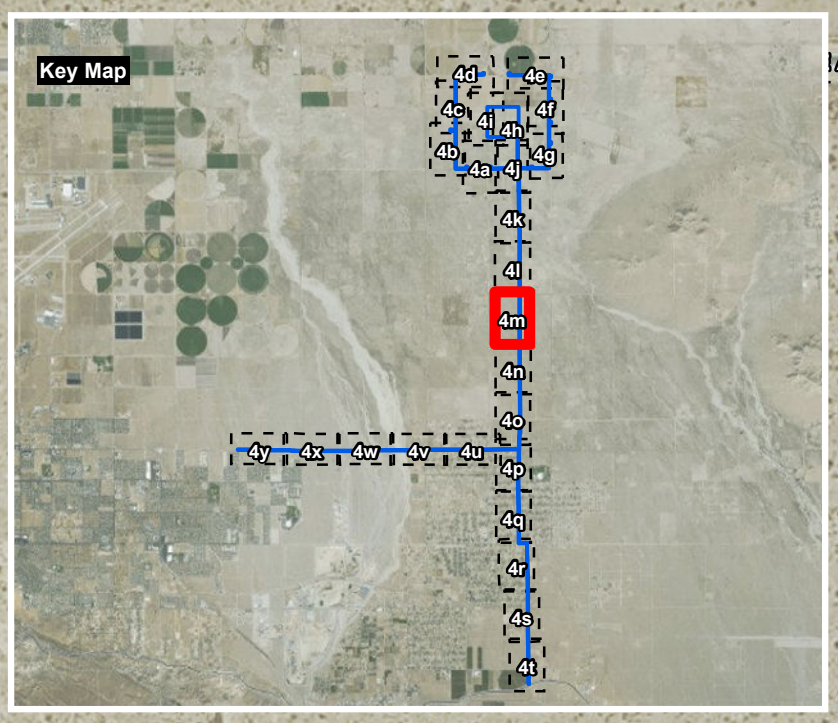
Figure 4l



Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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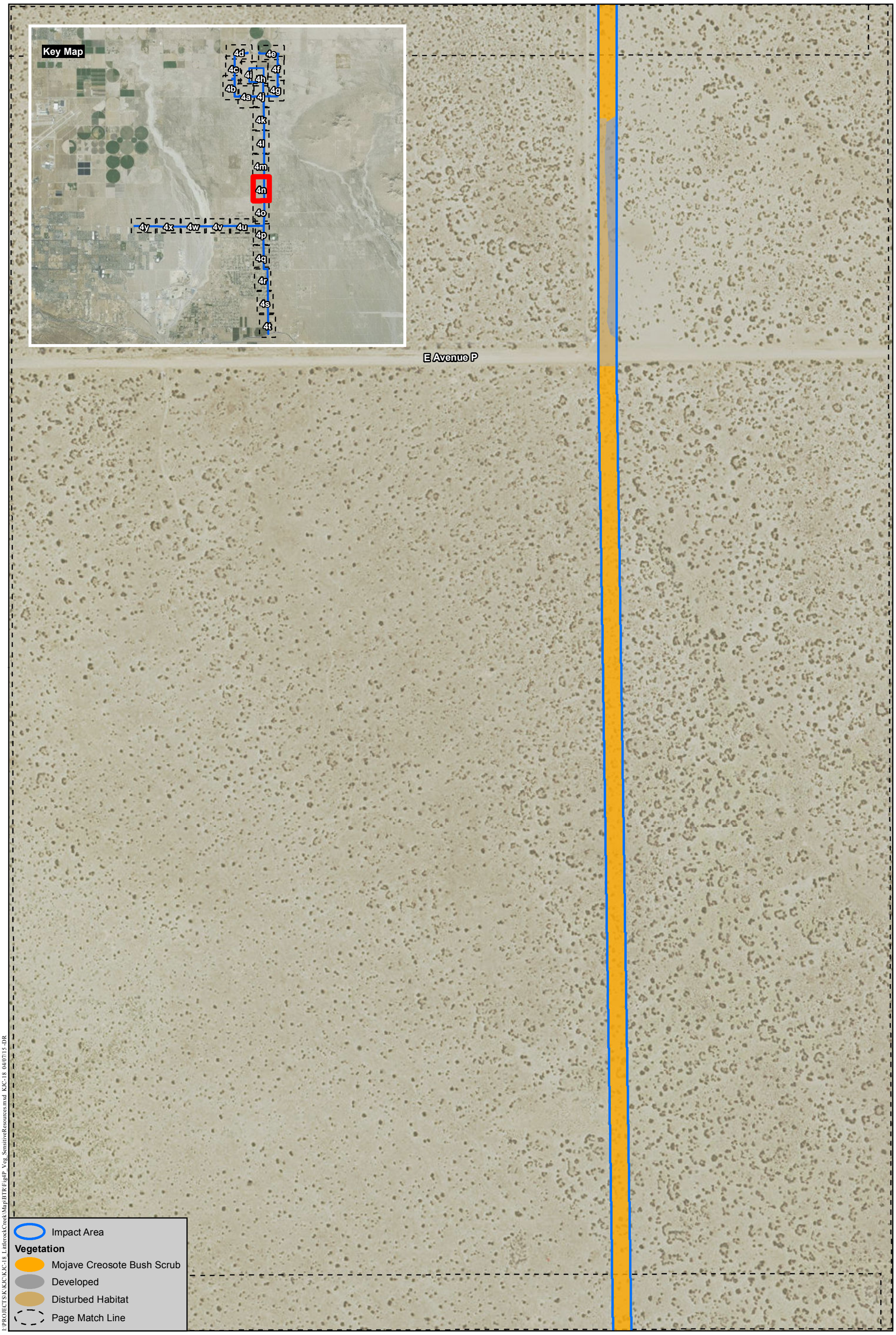
Figure 4m



Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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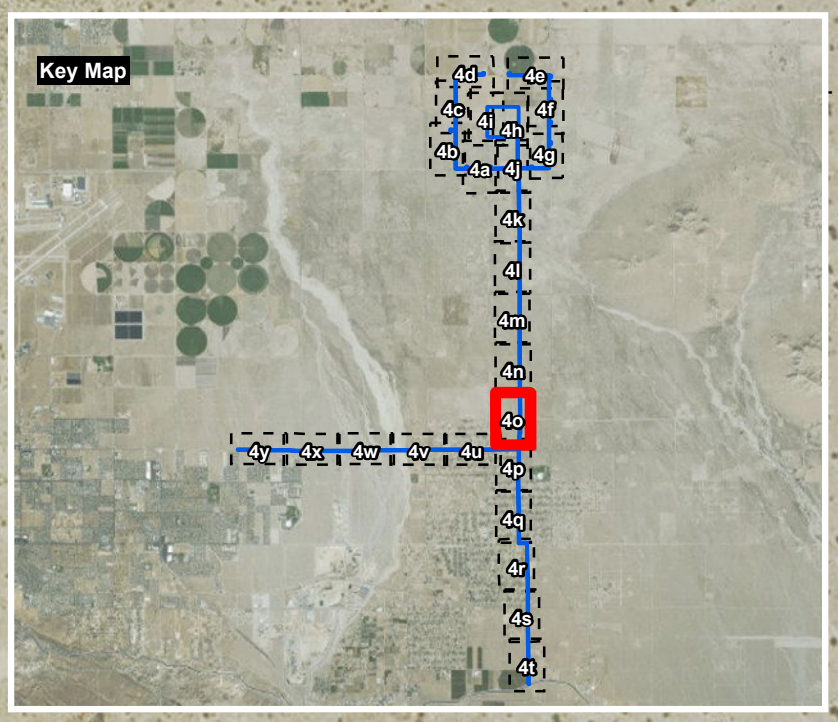
Figure 4n



E Avenue Q

Impact Area

Sensitive Resource

Burrow with Potential to Support Burrowing Owl

Vegetation

Mojave Creosote Bush Scrub

Disturbed Habitat

Desert Salt Bush Scrub

Non-Native Grassland

Page Match Line

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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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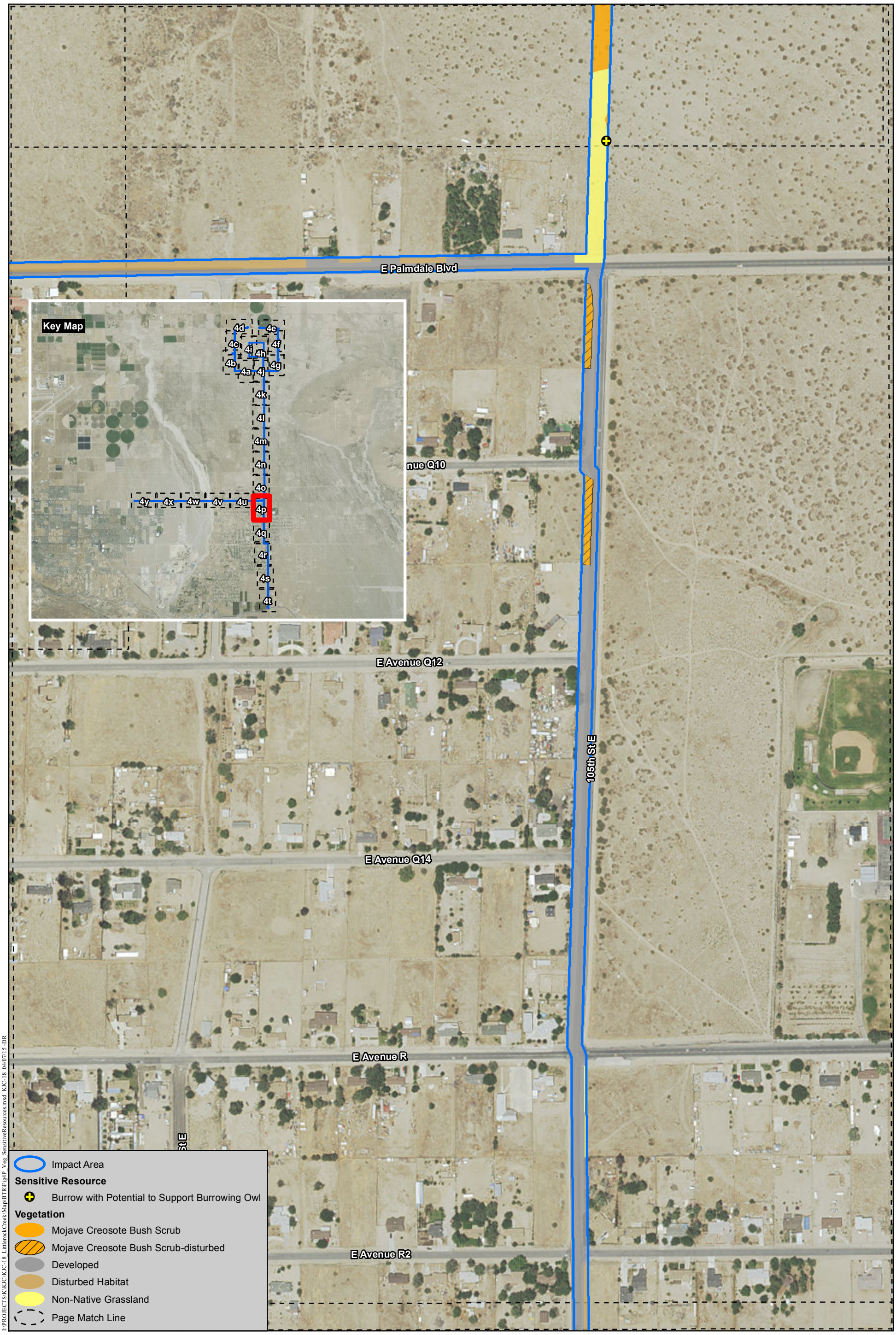
Figure 4o



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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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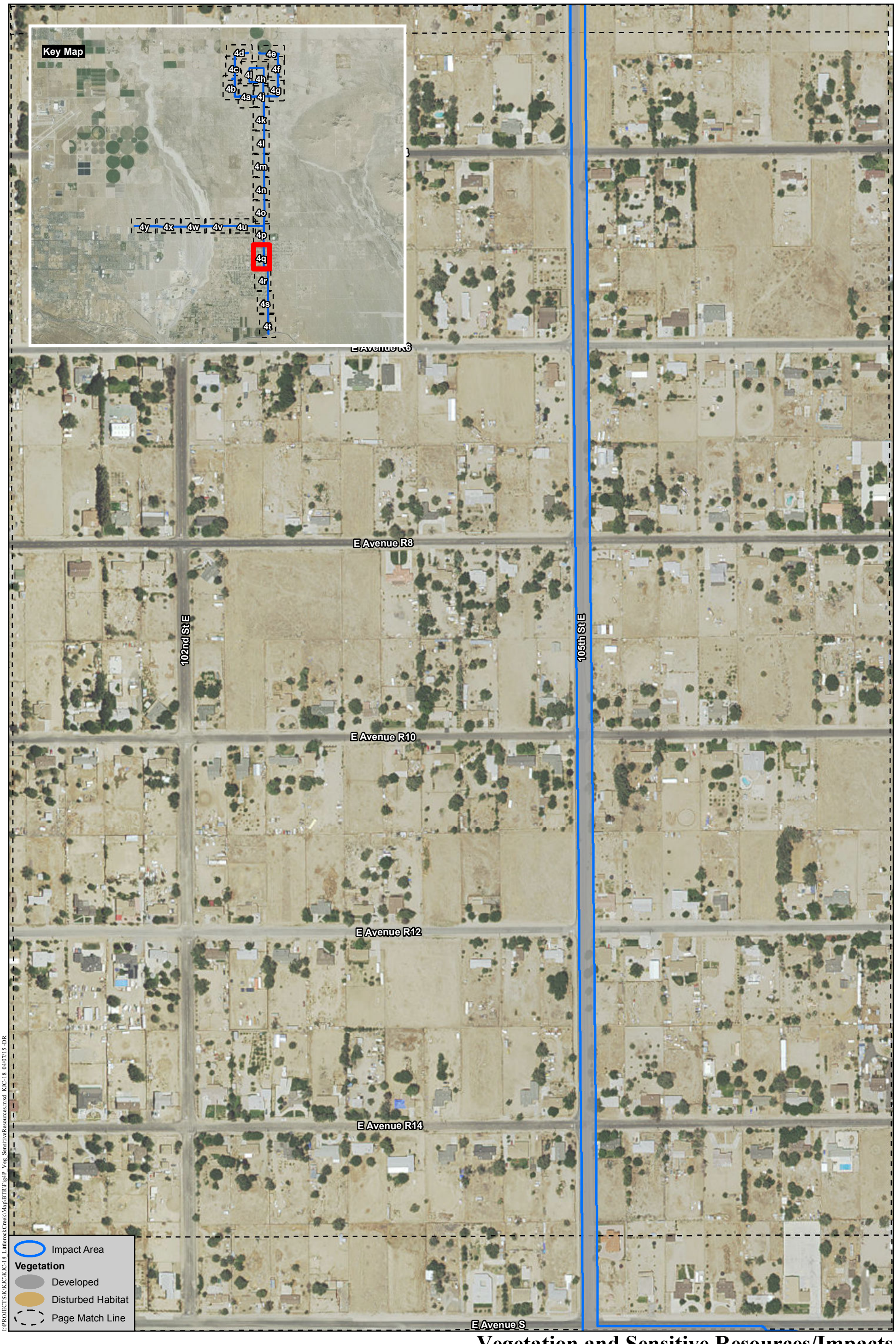
Figure 4p



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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

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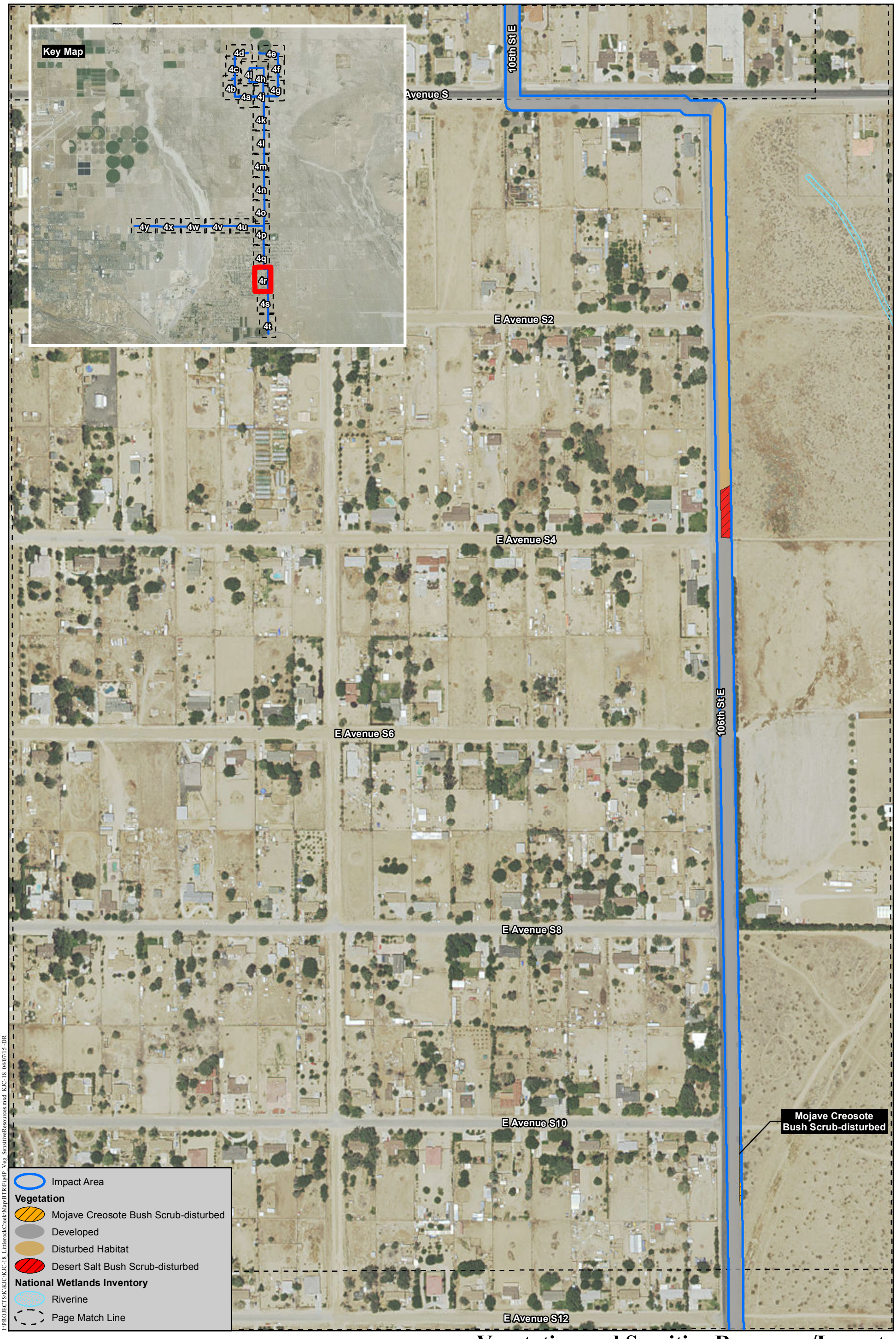
Figure 4q



Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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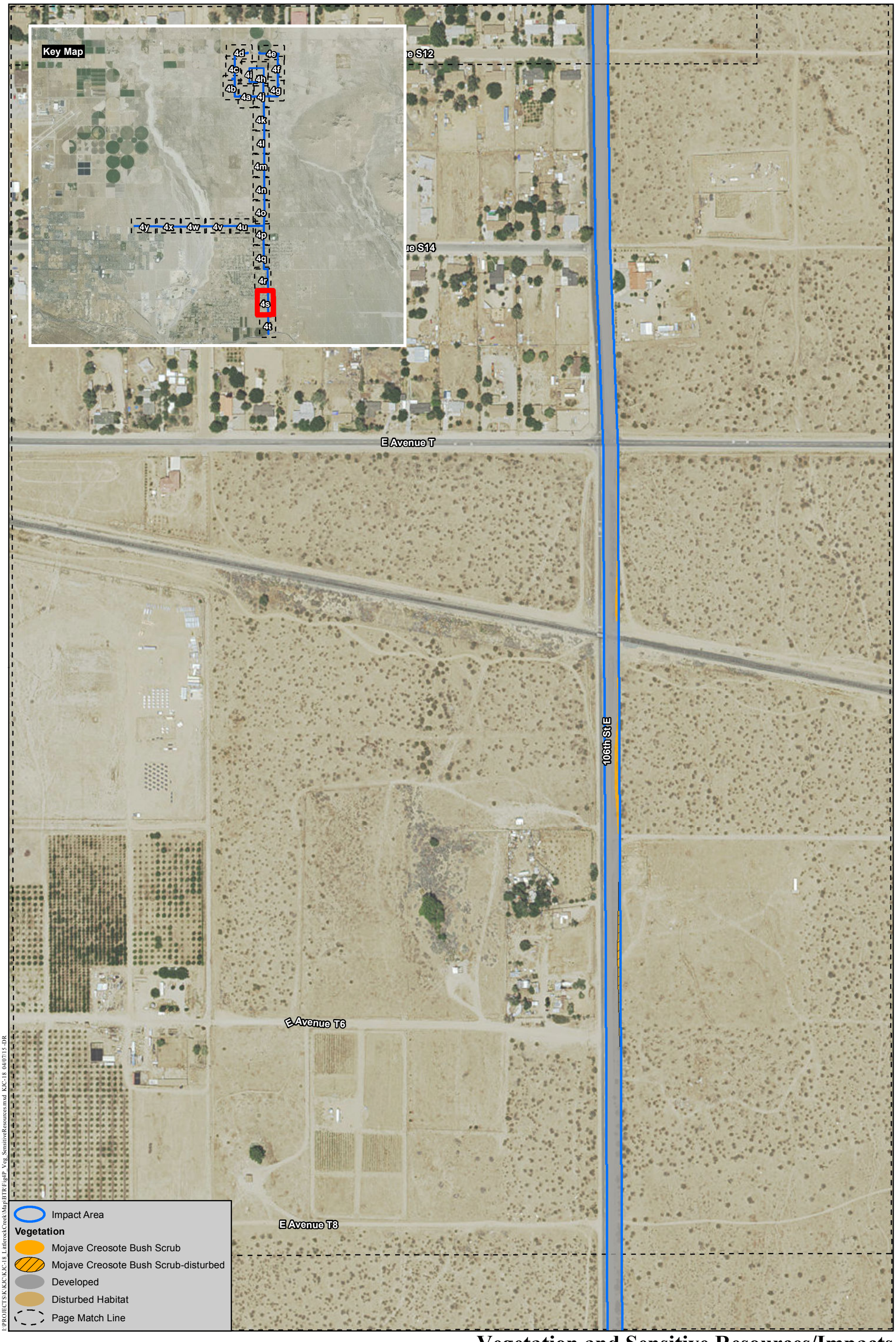
Figure 4r



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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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Figure 4s

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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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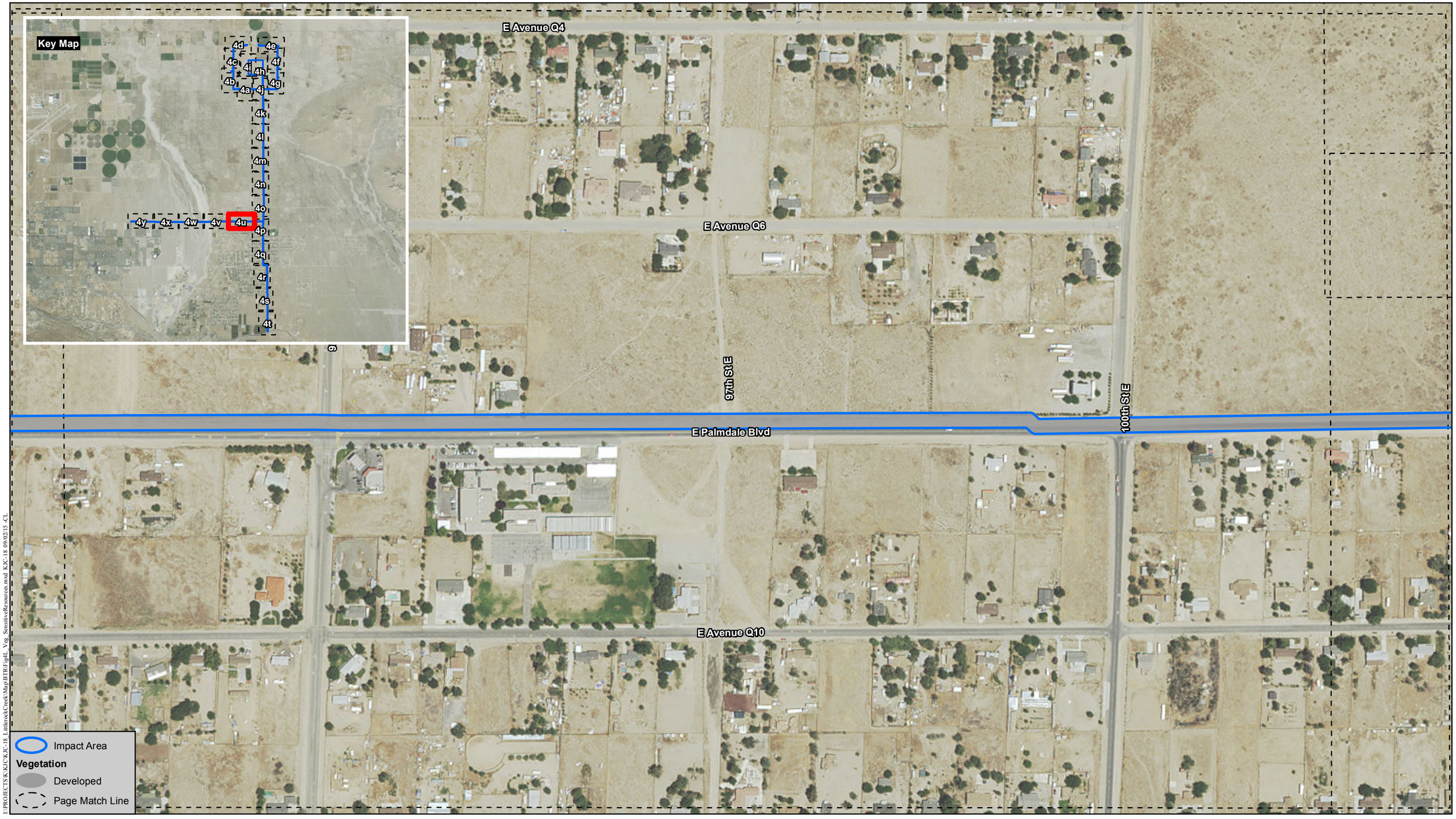
Figure 4t



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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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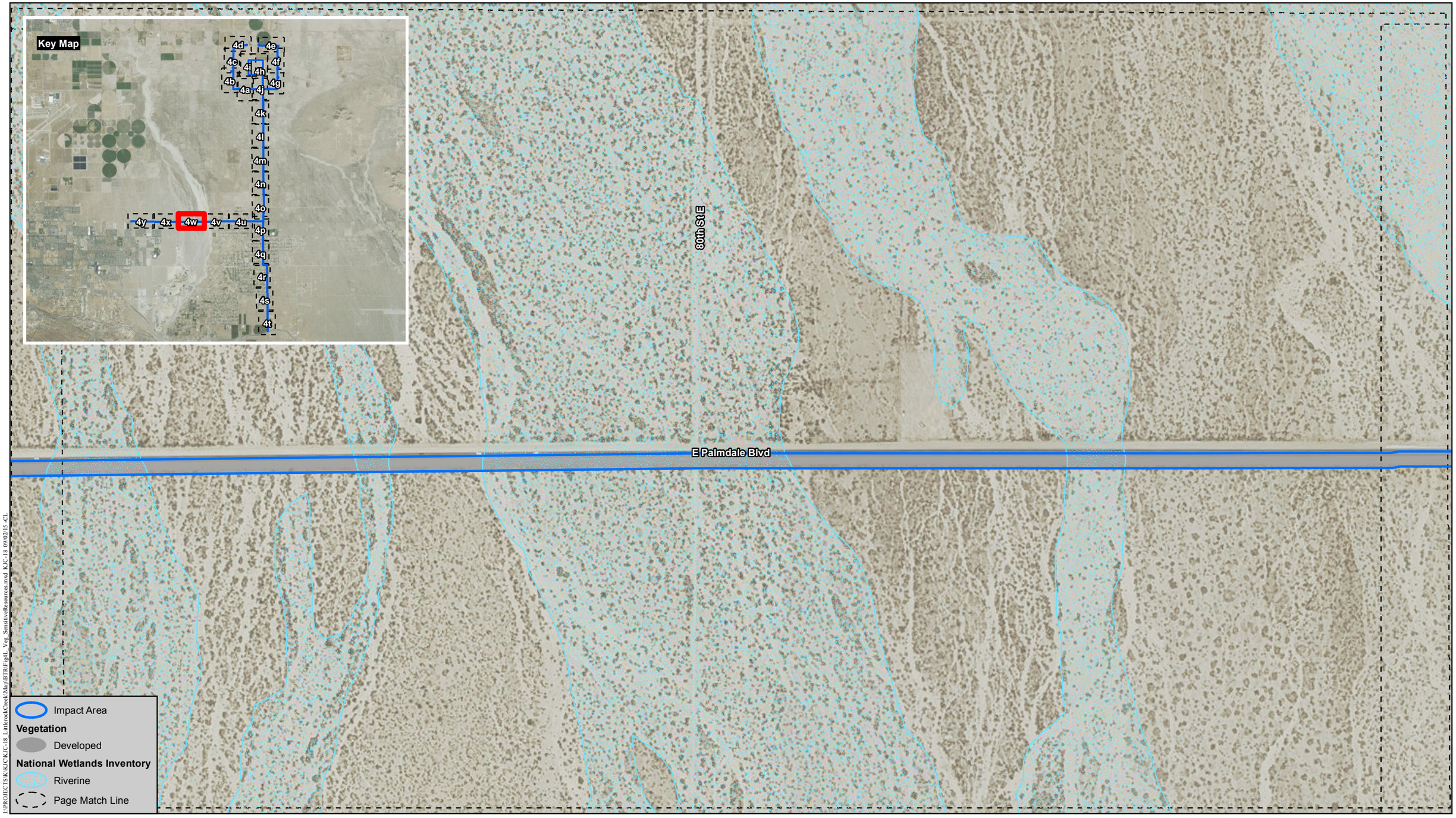
Figure 4v



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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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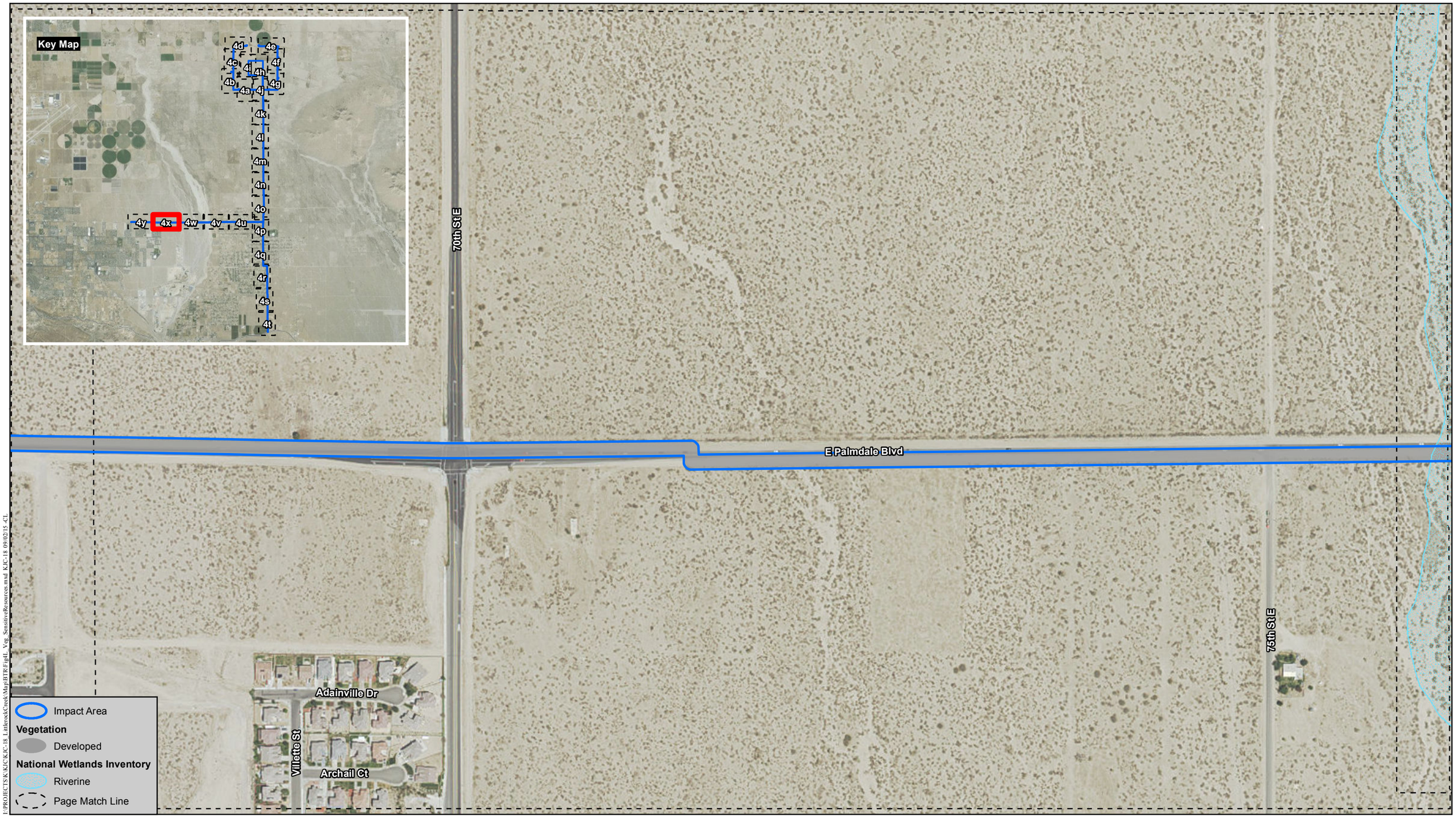
Figure 4w



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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

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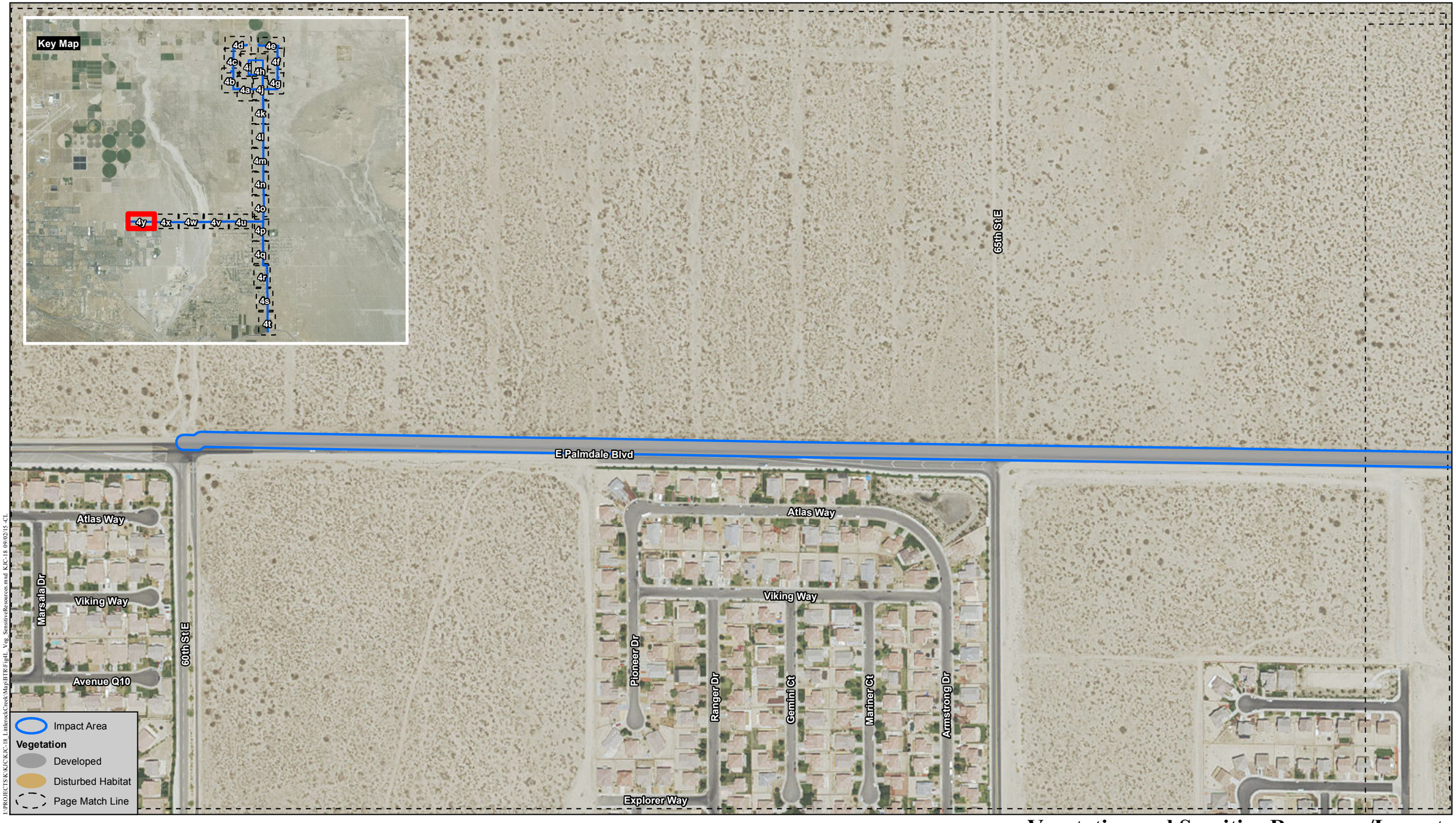

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Vegetation and Sensitive Resources/Impacts

PALMDALE REGIONAL GROUNDWATER RECHARGE AND RECOVERY PROJECT

HELIX Environmental Planning

0 300 Feet

Figure 4y

temporary Percolation Pond parcels were surveyed by driving the proposed routes where roads were present and stopping at various locations to inspect the vegetation and to take photographs. In areas where there was no road, surveys were done on foot. The areas were determined to not be suitable to support Mohave ground squirrel; therefore, trapping was also not warranted over these portions of the proposed Project impact area (Appendix A).

4.5.4 Burrowing Owl

HELIX made a total of four burrowing owl survey site visits to survey the proposed Project impact area (Figures 4a through 4y) plus a buffer of 150 meters following the survey guidelines detailed within the Staff Report on Burrowing Owl Mitigation prepared by the CDFW (2012). Private property and areas with restricted access within the 150-meter buffer were visually inspected through the use of binoculars. All site visits were made during daylight hours during the burrowing owl breeding season. Table 1 includes details for the survey including the survey times and weather conditions. Site visits were not made when visibility was limited by fog or during periods of high winds or rain which would reduce burrowing owl activity.

4.6 SURVEY LIMITATIONS

The Palmdale area experienced lower-than-average rainfall during the fall 2014/winter 2015 (rainfall was approximately 73 percent of normal during the period October 1, 2014 through August 30, 2015; National Weather Service 2015a) and notably higher than average daytime temperatures in the months of February and March 2015 (average of 9 ºF and 7 ºF above normal for each month, respectively; National Weather Service 2015b). The lower rainfall and higher temperatures during those two months may have adversely affected the germination and growth of some annual plant species. Since the majority of the proposed Project impact area (and approximate 50-meter buffer) has been disturbed in the past, primarily by agricultural activities but also, for example, residential development and road construction, the potential for sensitive plant species to occur is generally considered low, so the weather conditions are not expected to have had a significant effect on the results of the 2015 sensitive plant surveys. Sensitive plant species that were determined to have potential to occur during the literature review are addressed in this report (See Section 5.3.1).

Noted animal species were identified by direct observation, vocalizations, or the observance of scat, tracks, or other signs. However, the animal species observed or detected do not necessarily represent a comprehensive account of all species that utilize the proposed Project impact area because species that are nocturnal, secretive, or seasonally restricted may not have been observed/detected. Those species that are sensitive and have potential to occur based on the literature review are addressed in this report in Section 5.4.1.

5.0 SURVEY RESULTS

The survey results for vegetation communities/land uses, waters of the U.S. and waters of the State, plant species, and animal species are presented in this section. This section also indicates which biological resources are sensitive and why, and provides information for species with potential to occur in the proposed Project impact area but that were not observed.

5.1 VEGETATION COMMUNITIES/LAND USES

A total of 10 vegetation communities/land uses were mapped in the proposed Project impact area (Figures 4a through 4y; Table 2). Two of the communities are considered sensitive (vulnerable) by the CDFW (CDFW 2010): desert salt bush scrub and desert salt bush scrub–disturbed, each with a CDFW Rarity Ranking of S3.2. The CDFW's Rarity Ranking follows the NatureServe's Heritage Methodology (NatureServe 2009) in which communities are given a State (S) rank based on their degree of imperilment as measured by rarity, trends, and threats. Communities with a Rarity Ranking of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable) are considered sensitive.

Descriptions of the mapped vegetation communities/land uses are provided following Table 2.

Table 2
EXISTING VEGETATION COMMUNITIES/LAND USES
IN THE PROJECT IMPACT AREA

VEGETATION COMMUNITY/LAND USE*	RARITY RANKING	ACREAGE
Mojave creosote bush scrub (34100)	S4	19.4
Mojave creosote bush scrub-disturbed (34100)	S4	3.5
Desert salt bush scrub (36110)	S3.2	142.2
Desert salt bush scrub-disturbed (36110)	S3.2	26.0
Non-native grassland (42200)	S4	1.0
Non-vegetated channel (--)	--	0.1
Agriculture (inactive/fallow; --)	--	11.0
Agriculture (active; --)	--	10.5
Disturbed habitat (--)	--	44.6
Developed (--)	--	52.9
TOTAL	--	**311.2**

*Numbers in parentheses are Holland (1986) codes.

Mojave Creosote Bush Scrub (including –disturbed)

This vegetation community is dominated by widely spaced, medium to large shrubs, growing on sandy, well-drained soils. The ground between shrubs is usually bare, with ephemeral annuals in spring following winter rains. Creosote (*Larrea tridentata*) shrubs dominate the community with

occasional individuals of white bur-sage (*Ambrosia dumosa*) and burrobrush (*Ambrosia salsola*). Mojave creosote bush scrub is the most common habitat for Mohave ground squirrel.

Mojave creosote bush scrub that has been disturbed exhibits lower shrub cover and higher cover of non-native, herbaceous species than the undisturbed community. Disturbance could have been caused by previous vegetation clearing or agricultural uses, for example. Some of the non-native species that are present in the proposed Project impact area include cheatgrass (*Bromus tectorum*) and Mediterranean grass (*Schismus barbatus*).

Desert Salt Bush Scrub (including –disturbed)

Desert salt bush scrub consists of usually low, grayish, microphyllous shrubs, up to one meter tall, with some succulent species. Stands are typically strongly dominated by shad scale, with total cover often low and much bare ground between the widely spaced shrubs. This vegetation community is found in fine-textured, poorly drained soils with a high alkalinity and/or salinity, usually surrounding playas on slightly higher ground.

This community in the proposed Project impact area is dominated by allscale (*Atriplex polycarpa*), usually at low density with much bare ground, with subdominants including shad scale (*Atriplex canescens* ssp. *canescens*), creosote, rubber rabbitbrush (*Ericameria nauseosa)*, and valley lessingia (*Lessingia glandulifera*). Desert salt bush scrub is the dominant community on the Recharge Site (Figures 4h and 4i).

Where desert salt bush scrub is invaded in the proposed Project impact area by Russian thistle (*Salsola* spp.), tall tumble mustard (*Sisymbrium altissimum*), Mediterranean grass, and red-stem filaree (*Erodium cicutarium*), the areas were mapped as a "disturbed" phase of the community because these species usually invade after disturbance.

Non-native Grassland

Non-native grassland is a dense to sparse cover of annual grasses, which may be associated with showy-flowered, native, annual forbs. Characteristic species in this community in the proposed Project impact area include red brome (*Bromus madritensis*), Italian ryegrass (*Festuca perennis*), foxtail barley (*Hordeum murinum*), filaree (*Erodium botrys* and *E. cicutarium*), and black mustard (*Brassica nigra*). Most of the annual, introduced species that comprise the majority of species and biomass within non-native grassland originated from the Mediterranean region, an area with a long history of agriculture and a climate similar to California.

Non-vegetated Channel

Non-vegetated channel includes sandy, gravelly, or rocky fringes of waterways or flood channels. It is unvegetated on a relatively permanent basis, although some weedy species may grow along the outer edges channel and exhibit less than 10 percent total cover.

Agriculture (Inactive/Fallow)

This community in the proposed Project impact area includes agricultural fields that are not actively cultivated, but instead are mowed or otherwise managed.

Agriculture (Active)

Active agriculture in the proposed Project impact area includes agricultural fields that are actively cultivated.

Disturbed Habitat

Disturbed habitat is highly disturbed ground that retains a soil substrate. If it is vegetated at all, it supports an assemblage of almost exclusively non-native, weedy, upland species that colonize after human disturbance. There is no recognizable native or naturalized vegetation association, and characteristic species vary considerably depending on local colonization potential. Disturbed habitat within the proposed Project impact area is heavily dominated by several species of Russian thistle and shows signs of past human disturbance such as grading or agriculture.

Developed

Developed land has been built upon or physically altered to the point that it no longer naturally supports vegetation. Developed land can also include maintained landscaping. Developed land in the proposed Project impact area includes, for example, paved roads.

5.2 WATERS OF THE U.S. AND WATERS OF THE STATE

The National Wetlands Inventory (NWI; USFWS 2015) indicates that Little Rock Wash in the proposed Project survey area is classified as Riverine (Figures 4v and 4w). Little Rock Wash contains potential waters of the U.S. and waters of the State regulated by the USACE and CDFW, respectively.

Other NWI Riverine areas pass east of two of the Recovery Well sites (Figures 4e through 4g) and occur in the East Branch of the California Aqueduct (Figure 4t). While freshwater pond is included in the NWI adjacent to the proposed Project impact area (Figures 4f and 4g), there are no ponds or signs of ponding present.

5.3 PLANT SPECIES

A total of 74 plant species were observed in the proposed Project impact area and 50-meter buffer (Appendix C).

5.3.1 Sensitive Plant Species

Sensitive plant species include species that are listed as threatened or endangered by the USFWS; listed as threatened, endangered, or rare by the CDFW; or included in the CNPS' Inventory of Rare and Endangered Plants. Sensitive plant species that were determined to have potential to occur are listed in Appendix D. None of these species was observed.

5.4 ANIMAL SPECIES

A total of 40 animal species were observed or detected in the proposed Project impact area and 50-meter buffer (Appendix B).

5.4.1 Sensitive Animal Species

Sensitive animal species include those that have been afforded special status and/or recognition by federal and State resource agencies. In general, the principal reason an individual taxon (species or subspecies) is given such recognition is the documented or perceived decline or limitations of its population size or geographical extent and/or distribution, resulting in most cases from habitat loss. Sensitive animal species that were determined to have potential to occur are listed in Appendix E. Those for which focused surveys were conducted (desert tortoise, Mohave ground squirrel, and burrowing owl) and those four species that were observed (northern harrier, California horned lark, loggerhead shrike, and Le Conte's thrasher) are described below. No Critical Habitat for federal listed species occurs in or adjacent to the proposed Project impact area.

Desert tortoise (*Gopherus agassizii*)
Status: Federal Threatened, State Threatened
Distribution: Desert regions of California, southern Nevada, southwestern Utah, western Arizona, and Sonora, Mexico.
Habitat(s): Occurs in a variety of desert communities, particularly where creosote bush is common. Associated with sandy loam soils, particularly along washes, and spends the vast majority of time in burrows.
Observations in the study area: No desert tortoise or desert tortoise sign was observed during the 2015 survey.

Mohave Ground Squirrel (*Xerospermophilus mohavensis*)
Status: State Threatened
Distribution: Endemic to the western part of the Mojave Desert in portions of Inyo, Kern, Los Angeles, and San Bernardino counties.
Habitat(s): Occurs in a wide variety of habitats including Mojave creosote bush scrub, Mojave mixed woody scrub, desert salt bush scrub, blackbrush scrub, Mojave desert wash scrub, Joshua Tree woodland, and shadscale scrub. Mojave creosote bush scrub is the preferred habitat. The Mohave ground squirrel has also been found in some areas used for agriculture (USFWS 2011b).
Observations in the study area: The trapping survey of the Recharge Site produced no captures of Mohave ground squirrel. The remainder of the proposed Project impact area was determined to be unsuitable for the species. The following text further describes the results of the

Mojave ground squirrel trapping survey of the Recharge Site and the visual surveys of the remaining proposed Project impact areas conducted by Mike McGovern in 2015.

There are three historical records of Mohave ground squirrel sightings in the general area of the Recharge Site. One was in 1974 approximately 5.7 miles south-southeast of the Recharge Site, and two more sightings were from 1989. One is relatively close to the 1974 sighting in that it is about 7.3 miles southeast of the Recharge Site, and the other is approximately 8.3 miles south of the Recharge Site. It is evident that, at least historically, the general area contained a population of Mohave ground squirrels, but none has been observed in the past 26 years (McGovern 2015a, Appendix A).

Mohave ground squirrels are found in a variety of habitats in the western Mojave Desert but appear to prefer habitat with a variety of species of shrubs. The Recharge Site is primarily a monoculture of salt bush with lesser and isolated components of annual vegetation and shrubby perennials. The Recharge Site, therefore, appears to be poor habitat for the species. Even the usually common antelope ground squirrel (*Ammospermophilus leucurus*) is scarce. The Recharge Site is significantly disturbed and has been used as a place to deposit refuse and for agricultural purposes, as well for off-road vehicles (McGovern 2015a).

It is reasonable to conclude that the Mohave ground squirrel is not present on the Recharge Site based on 1) the negative survey results; 2) the paucity of other small mammals; 3) the poor habitat quality; 4) the site's level of disturbance; and 5) the fact that there have been no Mohave ground squirrels observed in the general area in the past 26 years (McGovern 2015a).

The habitat at the Distribution Site and along the 30-, 36-, and 48-inch pipeline routes was deemed not suitable to support the Mohave ground squirrel; therefore, they were not trapped (McGovern 2015b; Appendix A). Similarly, the habitat at the proposed Recovery Well locations and Well Collection Pipeline between wells and at the temporary Percolation Pond parcels was deemed not suitable to support the Mohave ground squirrel; therefore, were not trapped (McGovern 2015c; Appendix A). The habitat was not suitable because it 1) consisted of dirt and/or paved roads in developed areas; 2) consisted of sparsely vegetated and disturbed desert vegetation dominated by creosote bush (a variety of shrub species is preferred); 3) was significantly disturbed due to past agricultural activities and only supports annual plant species; and/or 4) is significantly disturbed and has been used as a place to deposit refuse (McGovern 2015b and 2015c).

Burrowing Owl (*Athene cunicularia*)
Sensitivity: State Species of Special Concern (Appendix F)
Distribution: The burrowing owl occurs across most of the Mojave and Colorado deserts of Inyo, eastern Kern, northern Los Angeles, San Bernardino, eastern Riverside, southern San Diego, and Imperial counties (Miller 2003 *in* Shuford et al. 2008.) Overall, regional numbers are low, and occupied areas are widely scattered, which is likely typical for this species in desert systems (Shuford et al. 2008). By contrast, numbers have increased greatly with the expansion of agriculture, particularly in the Imperial Valley and apparently along the lower Colorado River where the species was not reported prior to the advent of large-scale agriculture early in the 20th century (Rosenberg et al. 1991 *in* Shuford et al. 2008).

Habitat(s): The burrowing owl is primarily a grassland species but persists and may thrive in some landscapes highly altered by human activity. The primary elements of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only occasional, sparsely located shrubs and taller vegetation (Shuford et al. 2008).
Observations in the study area: The burrowing owl and an occupied burrow (a concrete pipe in the ground) were found along the Potable Water and Raw Water/Return Water Pipeline alignments (Figure 4l). Other, similar concrete pipes were found in the immediate vicinity that may be connected to the occupied pipe and form a burrow complex. Additionally, burrows with potential to support the burrowing owl were found in other locations in the proposed Project impact area, primarily on the Recharge Site (Figures 4h through 4l, 4o, and 4p).

Northern harrier (*Circus cyaneus*)
Sensitivity: State Species of Special Concern (Appendix F)
Distribution: Year-round resident of California found from below sea level (Death Valley) through grasslands, alpine meadows, and up to 10,000 feet amsl (CDFW, date unknown).
Habitat(s): Found in wide-open habitats, primarily scattered throughout lowlands but can also be observed in foothills, mountains, and desert.
Observations in the study area: One northern harrier was observed on one occasion flying over the Recharge Site (Figure 4h).

California horned lark (*Eremophila alpestris actia*)
Sensitivity: State Watch List (Appendix F)
Distribution: While a CDFW generalized map of the range of the California horned lark (CDFW 2007) does not show the subspecies *actia* occurring in the northeastern portion of Los Angeles County, there is need for review of the patterns of geographic variation for the many subspecies of horned lark (Beason 1995). Therefore, it is conservatively assumed herein, that the horned lark observed in the proposed Project study area is the *actia* subspecies.
Habitat(s): Coastal strand, grasslands, and desert scrub.
Observations in the study area: The California horned lark was observed in the impact area along the 30- and 36-inch pipelines (Figure 4m).

Loggerhead shrike (*Lanius ludovicianus*)
Sensitivity: Federal Bird of Conservation Concern, State Species of Special Concern (Appendix F)
Distribution: Occurs year-round within the southern portion of the United States.
Habitat(s): Grassland, open sage scrub, chaparral, and desert scrub.
Observations in the study area: The loggerhead shrike was observed along the Well Collection Pipeline southeast of the Recharge Site (Figure 4g).

Le Conte's thrasher (*Toxostoma lecontei*)
Sensitivity: Federal Bird of Conservation Concern, State Species of Special Concern (Appendix F)
Distribution: In California, Le Conte's thrashers nest west to near Julian, Palm Springs, Banning, the Antelope Valley, Walker Pass in Kern County, and, disjunctly, in the San Joaquin Valley. The northern range limit extends to the Owens Valley, Panamint Valley, and Death Valley and then east to Nevada and onto the Beaver Dam Mountains in the southwestern corner

of Utah, and southeastward to central and southern Arizona (Prescott 1999 *in* Weigand and Fitton 2008).
Habitat(s): The Le Conte's thrasher prefers open desert with scattered shrubs and sandy and/or alkaline soils. It is rarely found in riparian vegetation or on agricultural lands (Weigand and Fitton 2008).
Observations in the study area: One Le Conte's thrasher was observed in the southwest portion of the Recharge Site (Figure 4i).

5.5 WILDLIFE MOVEMENT CORRIDORS

Wildlife corridors connect otherwise isolated blocks of habitat and allow movement or dispersal of plants and animals. Local wildlife corridors allow access to resources such as food, water, and shelter within the framework of their daily routine. Regional corridors provide these functions over a larger scale and link two or more large habitat areas, allowing the dispersal of organisms and the consequent mixing of genes between populations. A corridor is a specific route that is used for the movement and migration of species, and may be different from a linkage in that it represents a smaller or narrower avenue for movement. A linkage is an area of land that supports or contributes to the long-term movement of animals and genetic exchange by providing live-in habitat that connects to other habitat areas. Many linkages occur as stepping stones that are comprised of a fragmented archipelago arrangement of habitat over a linear distance.

The proposed Project impact area is located within a relatively broad, alluvial plain and exhibits a generally level topographic profile. It does not connect isolated blocks of habitat, rather it occurs among a patchwork of desert scrub vegetation communities, agricultural land, and residential developments that continue in all directions beyond it. The impact area, therefore, is not a specific route used by wildlife to move between habitat areas; nor is it a specific linkage that connects to other habitat areas. It does provide live-in habitat for some species.

The draft Desert Renewable Energy Conservation Plan (DRECP; California Energy Commission, et al. 2014) and the Draft County of Los Angeles General Plan (Los Angeles County 2014), whose boundaries include the area of the proposed Project, considered wildlife movement in the general region of the proposed Project. The draft DRECP mapped several important wildlife linkages and landscape blocks in the region, but these areas do not occur within or adjacent to the proposed Project impact area (California Energy Commission, et al. 2014). The draft General Plan identified areas of regional wildlife linkages in the region. Several of these areas have been designated or proposed as Significant Ecological Areas (SEAs). The proposed Project's 30-inch Recycled Water Pipeline crosses through the adopted Little Rock Wash SEA; however, the pipeline would be underground and installed within an existing roadway right-of-way, which already presents a physical barrier along this SEA, and as such, would not affect wildlife movement.

6.0 PROJECT IMPACTS

This section describes potential direct and indirect impacts associated with development of the proposed Project, as well as outlines the criteria used for determining the significance of impacts. Direct impacts immediately alter the affected biological resources such that those resources are eliminated temporarily or permanently, such as through the removal of vegetation. Indirect impacts consist of secondary effects of a project, such as those from fugitive dust, noise, drainage and pollutants (affecting water quality), invasive plant species, nuisance animal species, night lighting, and human activity.

6.1 CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE

The proposed Project would have a significant impact if it would:

1. Have a substantial adverse effect either directly or through habitat modifications on any species identified as a candidate, sensitive, or special status[1] in local or regional plans, policies, or regulations, or by the CDFW or the USFWS;

2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS;

3. Have a substantial adverse effect on federal protected water quality or wetlands as defined by Section 404 of the CWA through direct removal, filling, hydrological interruption, or other means;

4. Interfere substantially with the movement of native resident or migratory fish or wildlife species, wildlife corridors, or wildlife nursery sites;

5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and/or

6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

6.2 DIRECT IMPACTS

6.2.1 Vegetation Communities/Land Uses

The proposed Project would impact a total of 311.2 acres of vegetation communities/land uses (as presented in Table 3.2-1). Of the total 311.2 acres, 168.2 acres represent permanent impacts to sensitive natural communities, and specifically, desert saltbush scrub, which has a statewide rarity ranking of S3.5. Impacts to this community are also expected on portions of the Recharge

[1] Specifically for plant species, impacts would be significant for those that are: (1) State or federal listed and/or (2) CNPS Rare Plant Rank 1 or 2 species.

Site that are outside of the 110-acre fenced area, including permanent impacts to 10 acres for soil stockpiling and minor temporary impacts to portions of the remaining 40-acre, unfenced area. The temporary impacts are not anticipated to be extensive and would likely consist of some equipment access in order to construct the recharge basins, as well as disturbance from installing the fence.

Table 3
PERMANENT IMPACTS AND POTENTIAL CONSERVATION OF VEGETATION COMMUNITIES/LAND USES

VEGETATION COMMUNITY/LAND USE[1]	RARITY RANKING	ACREAGE IMPACTED	ACREAGE OF POTENTIAL CONSERVATION[2]
Mojave creosote bush scrub (34100)	S4	19.4	--
Mojave creosote bush scrub-disturbed (34100)	S4	3.5	--
Desert salt bush scrub (36110)	S3.2	142.2	42.3
Desert salt bush scrub-disturbed (36110)	S3.2	26.0	6.1
Non-native grassland (42200)	S4	1.0	--
Non-vegetated channel (--)	--	0.1	--
Agriculture (inactive/fallow; --)	--	11.0	--
Agriculture (active; --)	--	10.5	--
Disturbed habitat (--)	--	44.6	1.6
Developed (--)	--	52.9	--
TOTAL	**--**	**311.2**	**50.0**

[1] Numbers in parentheses are Holland (1986) codes.
[2] The proposed Project would include conservation of approximately 40 of the 50 acres located outside of the fenced portion of the Recharge Site. The location of the 10 acres that would be used for soil stockpiling is undetermined at this time; therefore, the entire 50 acres is shown as the potential conservation area (Figures 4h and 4i).

The proposed Project would include conservation of approximately 40 of the 50 acres located outside of the fenced portion of the Recharge Site. The location of the 10 acres that would be used for soil stockpiling is undetermined at this time; therefore, the entire 50 acres is shown as the potential conservation area (Figures 4h and 4i). These 50 acres include 48.4 acres of desert saltbush scrub within outside of the 110-acre Recharge Site (Table 3). This land is within PWD ownership, and the approximately 40 acres of the land that would not be used for soil stockpiling would remain in open space, in perpetuity. The land would be placed in a conservation easement, restrictive covenant, or other legal protective mechanism as part of the proposed Project.

The proposed Project's impacts to desert salt bush scrub and desert salt bush scrub-disturbed are considered less than significant, as explained below.

Desert salt bush scrub has a rarity ranking of S3, which is considered to be highly imperiled; therefore, the community is considered a High Priority Vegetation Type by the CDFW (CDFW 2015e). However, CDFW, in Addressing High Priority Vegetation Types, further assesses priority according to vegetation community quality and the quantity impacted. High quality communities include, for example, those that lack invasive, exotic species and have no evidence of human-caused disturbance (CDFW 2015e). Desert salt bush scrub in the proposed Project impact area, which is almost entirely on the Recharge Site, is significantly disturbed (by humans) as the Recharge Site has been used as a place to deposit refuse and for agricultural purposes, as well for off-road vehicles (McGovern 2015a). Desert salt bush scrub-disturbed in the proposed Project impact area has also been disturbed by humans and has been invaded by exotic plant species such as Russian thistle, tall tumble mustard, Mediterranean grass, and red-stem filaree (Appendix C). Neither desert salt bush scrub nor desert salt bush scrub-disturbed was found to support highly sensitive species such as Mohave ground squirrel and desert tortoise.

Desert salt bush scrub is widely scattered on the margins of dry lakebeds in the Colorado, Mojave, and Great Basin deserts (Holland 1986; that are located in parts of California, Arizona, New Mexico, Nevada, Utah, Oregon, Washington, Wyoming and Idaho) at elevations from below sea level to more than 5,900 feet amsl. The Desert Renewable Energy Conservation Plan (DRECP) Area encompasses 22,585,000 acres of southeastern California north, east, and southeast of the proposed Project impact area. The DRECP Area spans the Mojave and Colorado/Sonoran deserts and a small portion of the Great Basin Desert. The vast DRECP Area is bounded by Baja California, Mexico to the south; Arizona and Nevada to the east; the Sierra Nevada and Tehachapi mountain ranges to the north and northwest; and the Peninsular and Transverse mountain ranges to the west. Approximately 361,909 acres of desert salt bush scrub have been mapped in the DRECP Area alone (California Energy Commission, et al. 2014). The proposed Project would impact less than 0.001 percent (0.00046 percent) of the total amount of desert saltbush scrub mapped in the DRECP Area.

The proposed Project's impacts to lower quality desert salt bush scrub (142.2 acres) and desert salt bush scrub-disturbed (26.0 acres) that do not support highly sensitive species and are small in area compared to the overall coverage of desert salt bush scrub in just the DRECP Area (361,909 acres) would, therefore, be less than significant in accordance with the CDFW guidelines for addressing High Priority Vegetation Types, and no mitigation would be required.

Impacts to non-sensitive vegetation communities and land uses, such as agriculture, would be less than significant, and no mitigation would be required.

6.2.2 Waters of U.S. and Waters of the State

The proposed Project has been designed to avoid impacts to potential jurisdictional areas, as follows. The 30-inch Potable Water Pipeline along East Palmdale Boulevard has been designed to be constructed within the right-of-way of the road (Figures 4v and 4w). Additionally, the Recovery Wells, Well Collection Pipeline, and temporary Percolation Pond parcels along 110th Street (east of the Recharge Site) have been located west of the street to avoid the potential jurisdictional areas located east of the street (Figures 4e through 4g).

With the proposed Project design, there would be no impacts to waters of the U.S. and waters of the State, and no mitigation or permitting would be required.

6.2.3 Sensitive Plant Species

Eight sensitive plant species were evaluated for their potential to occur in the proposed Project impact area, and all have either low potential to occur or no potential to occur (Appendix D). None of these species was observed during proposed Project surveys, nor were any other sensitive plant species. Therefore, no sensitive plant species would be impacted, and no mitigation would be required.

6.2.4 Sensitive Animal Species

The proposed Project has the potential to cause direct, adverse effects to sensitive animal species during construction. These impacts would occur primarily from vegetation removal and grading activities, which would cause loss of habitat and potentially cause direct injury or mortality to individuals. Twelve sensitive animal species were evaluated for their potential to occur in the proposed Project impact area (Appendix E). Five of these species were observed in the proposed Project impact area: loggerhead shrike, northern harrier, California horned lark, Le Conte's thrasher, and burrowing owl. Two species not observed but with moderate potential to occur include coast horned lizard (*Phrynosoma blainvillii*) and prairie falcon (*Falco mexicanus*; i.e., moderate potential to forage; no nesting habitat present). The other five species have low potential to occur or are not expected to occur.

Direct injury or mortality to the loggerhead shrike, northern harrier, California horned lark, Le Conte's thrasher, and prairie falcon (the latter of which has moderate potential to occur) is not anticipated as these species can move out of harm's way (see Section 6.2.5 regarding nesting birds, however). The loss of habitats for these species (desert salt bush scrub and Mojave creosote bush scrub) would be less than significant due to the widespread nature of these communities and the species' lower levels of sensitivity. Direct injury or mortality to the coast horned lizard if it was to be present (it has moderate potential to occur) and the loss of its potential habitats would also be less than significant for the reasons stated above (widespread habitats and low level of sensitivity). In summary, direct impacts to these sensitive animal species would be less than significant according to Significance Criterion 1, and no mitigation would be required.

According to the *Staff Report on Burrowing Owl Mitigation* (CDFW 2012), the following types of activities have potential to significantly impact the burrowing owl, its nests or eggs, and destroy or degrade its habitat during construction: grading, earthmoving, burrow blockage, and heavy equipment or vehicles compacting and crushing burrow tunnels (CDFW 2012). A burrowing owl with a burrow was found in the proposed Project impact area (Figure 4l). Burrowing owls and occupied burrows in the proposed Project impact area, or within 500 feet of the proposed Project impact area (CDFW 2012) could be substantially, adversely affected by proposed Project construction (Significance Criterion 1), and mitigation would be required. Successful implementation of the mitigation listed in Section 7.1.1 would be expected to reduce the impacts to less-than-significant levels.

6.2.5 Nesting Birds

Potential direct impacts to nesting birds protected by the MBTA and California Fish and Game Code could result if clearing of vegetation or construction occurs during the breeding season (generally February through August and, for raptors, January through August). Clearing of vegetation or construction activities could cause destruction or abandonment of active nests or mortality of adults, young, or eggs. Impacts to nesting birds would be considered significant according to Significance Criterion 1, and mitigation would be required. Successful implementation of the mitigation listed in Section 7.2 would reduce the impacts to less-than-significant levels.

6.2.6 Wildlife Corridors

As described in Section 5.5, the proposed Project impact area is not in a specific route used by wildlife to move between habitat areas, nor is it a specific linkage that connects to other habitat areas. Therefore, the proposed Project would not interfere with the movement of wildlife or wildlife corridors (Significance Criterion 4), and no mitigation would be required.

While some species may use the impact area for breeding or nesting, no wildlife nursery sites are known or expected to occur there. A wildlife nursery site is a specific, established location often used repeatedly for breeding purposes, such as a heron rookery or bat maternal colony roost. Therefore, the proposed Project would not interfere with wildlife nursery sites (Significance Criterion 4), and no mitigation would be required.

6.2.7 Compliance with Regional Conservation Plans, Local Ordinances, and Policies

The PWD is a special district; therefore, the regional (i.e., West Mojave Plan) and local plans and policies (i.e., the city and county plans listed in Section 4.1) do not apply to the proposed Project. Therefore, the proposed Project would not conflict with any regional conservation plans, local ordinances, or policies protecting biological resources (Significance Criteria 5 and 6), and no mitigation would be required.

6.3 INDIRECT IMPACTS

Potential indirect impacts from construction and/or operation of the proposed Project include fugitive dust, noise, decreased water quality, invasive plant species, nuisance animal species, night lighting, and human activity (including road kill).

6.3.1 Fugitive Dust

Fugitive dust produced by construction could disperse onto adjacent native vegetation. A continual cover of dust may reduce the overall vigor of individual plants by reducing their photosynthetic capabilities and increasing their susceptibility to pests or disease. This, in turn, could affect animals dependent on these plants (e.g., seed-eating rodents). Fugitive dust also may make plants unsuitable as habitat for insects and birds. Proposed Project construction, therefore, could have a substantial adverse effect on sensitive species (Significance Criterion 1)

and/or sensitive vegetation communities (Significance Criterion 2), and mitigation would be required. Successful implementation of the mitigation in Section 7.3.1 would reduce the impacts to less-than-significant levels.

6.3.2 Noise

Noise resulting from construction including grubbing, grading, and vehicular traffic would be a temporary impact to local, sensitive wildlife. Due to its temporary nature, the impact would be adverse but not substantial (Significance Criterion 1), and no mitigation would be required.

6.3.3 Water Quality

Water quality can be adversely affected by potential surface runoff and sedimentation during construction. The use of petroleum products (fuels, oils, and/or lubricants) and erosion of cleared land during construction could potentially contaminate surface waters and drainages such as Little Rock Wash. Decreased water quality may adversely affect vegetation and wildlife. This impact would be potentially significant under Significance Criteria 1 and 2, and mitigation would be required. Successful implementation of the mitigation listed in Section 7.3.2 would reduce the impact to a less-than-significant level.

6.3.4 Invasive Plant Species

Many non-native plant species are highly invasive and can, among other things, displace native vegetation and reduce native species diversity, change ground and surface water levels, and adversely affect native wildlife that is dependent on the native plant species.

Construction and ground disturbance activities can spread non-native plant species from developed or disturbed areas to areas of native vegetation. However, the proposed Project lies within an area that has already experienced high levels of disturbance from previous agricultural activities and land clearing, and non-native plant species are already present inside and outside the proposed Project impact area (see Appendix C). Therefore, the proposed Project is not expected to have a substantial adverse effect on sensitive species (Significance Criterion 1) or sensitive vegetation communities (Significance Criterion 3), and no mitigation would be required.

6.3.5 Nuisance Animal Species

The introduction of artificial water sources into arid environments can result in the spread of already-present exotic ants such as the Argentine ant (*Linepithema humile*). The Argentine ant was observed during proposed Project surveys (see Appendix B). The Argentine ant likely became established in the proposed Project impact area due to agriculture and residential development and its associated irrigation. Argentine ants out-compete native ants that are the primary prey item for the sensitive coast horned lizard (see Appendix E), adversely affecting that species. The optimal environment for Argentine ants is characterized by moderate temperatures and moisture levels, and moisture gradients regulate invasiveness of this species. Argentine ants generally penetrate farther into moist habitats than into dry and sparse habitats

(Krushelnycky and Suarez 2009). Since the area surrounding the Recharge Site supports dry, sparse habitat, it is anticipated that if Argentine ants are on the Recharge Site that they would not spread far beyond it into the drier habitat of the coast horned lizard; they would more likely spread toward irrigated agricultural land. Therefore, the proposed Project would not be anticipated to have a substantial adverse effect on a sensitive species from the Argentine ant (Significance Criterion 1), and no mitigation would be required.

Water sources can also increase numbers of predators such as common raven (*Corvus corax*) and coyote (*Canis latrans*), both observed or detected during proposed Project surveys (see Appendix B), which are known to prey on desert tortoise and other native species. The Recharge Site would, however, be surrounded by an eight-foot-high chain link fence (topped with three-strand barbed wire), which would exclude the coyote. Therefore, the number of coyotes would not increase due to this new water source.

The common raven gets its water primarily through the food it eats, but if this is not sufficient, it will drink water (Semenchuck 1992). While the new water source could attract (more) ravens to the area of the Recharge Site, a potential increase in numbers is not expected to have a substantial effect on sensitive species (Significance Criterion 1) because the primary potential prey species, which are also the most sensitive, the State and/or federal listed desert tortoise and Mohave ground squirrel, are not present. Therefore, a potential increase in common raven numbers would not require mitigation. Impacts from a potential increase in common ravens on non-sensitive, native species would not meet any of the significance criteria, so no mitigation would be required.

Avian botulism is a paralytic disease caused by ingestion of a toxin produced by the bacterium, *Clostridium botulinum*. This bacterium is widespread in soil and requires warm temperatures, a protein source, and an anaerobic environment to become active and produce toxin. Decomposing vegetation and invertebrates combined with warm temperatures can provide ideal conditions for the bacterium (USGS 2013). Birds either ingest the toxin directly or eat invertebrates containing the toxin. The PWD would prevent/control the growth of vegetation in the bottom of the recharge basins by disking, as necessary, and the interior slopes of the basins would be shotcrete that would prevent the growth of vegetation surrounding the water. The prevention/control of vegetative growth would reduce or eliminate invertebrates dependent on such vegetation and would eliminate the potential for decomposing vegetation in the basins. Therefore, PWD's vegetation management activity would prevent the production of the ideal conditions for the bacterium, and the potential for avian botulism would be significantly reduced. Consequently, the proposed Project would not have a substantial adverse effect on sensitive species (Significance Criterion 1) or non-sensitive species, and no mitigation would be required.

6.3.6 Night Lighting

Night lighting exposes wildlife to an unnatural light regime that may adversely affect foraging patterns, increase predation risk, cause biological clock disruptions, and disrupt wildlife movement.

With the exception of well drilling and testing and perhaps pipeline installation on busy roadways, proposed Project construction activities would occur during the daytime. If night lighting is used during construction associated with well drilling and testing and pipeline installation, it would be shielded and directed away from adjacent sensitive vegetation in accordance with the proposed Project Design Feature for lighting listed in Section 1.2. Implementation of the proposed Project Design Feature would reduce potentially significant impacts from might lighting, particularly for sensitive species (Significance Criterion 1) to less-than-significant levels, and no mitigation would be required.

Proposed Project operation will include night lighting. Outdoor night lighting is intended for occasional maintenance activities and would be provided at the following locations: SWP Turnout, Storage Tank/Distribution Site, each of the recharge basins (one on each inlet and outlet; total 8), the Splitter Box, and at each of the Recovery Wells (potentially above each well building door and general site lighting). These lights would not be expected to be normally on and would potentially have lockable light switches. Night lighting has the potential to have a substantial adverse effect on sensitive species in adjacent sensitive vegetation (Significance Criterion 1) when it is on. However, implementation of the proposed Project Design Feature for lighting listed in Section 1.2 would reduce this potentially significant impact to a less-than-significant level, and no mitigation would be required.

6.3.7 Human Activity

Increases in human activity in an area can result in the degradation of sensitive vegetation/wildlife habitat outside a project impact area through, for example, the creation of unauthorized trails. This impact would be potentially significant (Significance Criteria 1 and 2). Implementation of proposed Project Design Features (e.g., fencing and monitoring) listed in Section 1.2, however, would reduce this potentially significant impact to a less-than-significant level, and no mitigation would be required.

Increases in vehicular activity due to a project can cause increases in road-killed wildlife. Use of unpaved proposed Project access roads could result in an increase in road kill, which could have a substantial adverse effect on sensitive species (e.g., coast horned lizard should it be present; Significance Criterion 1); however, implementation of proposed the Project Design Feature listed in Section 1.2 (i.e., speed of 15 mph) would reduce this potentially significant impact to a less-than-significant level, and no mitigation would be required.

7.0 MITIGATION

The following measures are proposed to mitigate for significant, or potentially significant, direct and indirect impacts from development of the proposed Project.

7.1 SENSITIVE ANIMAL SPECIES

7.1.1 Burrowing Owl

A pre-construction take avoidance survey shall be conducted for each phase of construction. The survey shall be completed no more than 14 days prior to ground-disturbing activities and shall cover the proposed Project impact area and all potential burrowing owl habitat within 500 feet, as feasible. More specifically, the survey shall cover all proposed Project features except (1) where the 30-inch Potable Water Pipeline would occur in East Palmdale Boulevard; and (2) where the 36-inch Raw Water/Return Water Pipeline would be constructed between East Avenue R2 in the north and East Avenue S in the south.

If there is no sign of burrowing owl occupation (as defined in CDFW 2012), then no further mitigation is required. If sign of occupation is present, the following mitigation shall be implemented.

Direct impacts to occupied burrowing owl burrows shall be avoided during the breeding period from February 1 through August 31 (CDFW 2012). “Occupied” is defined as a burrow that shows sign of burrowing owl occupancy within the last three years.

Direct impacts to occupied burrows shall also be avoided during the non-breeding season. Burrow exclusion is a technique of installing one-way doors in burrow openings during the non-breeding season to temporarily exclude burrowing owl, or permanently exclude burrowing owl and close burrows after verifying burrows are empty by site monitoring and scoping. Eviction of burrowing owl during the non-breeding season would require prior CDFW approval of a Burrowing Owl Exclusion Plan (CDFW 2012).

The burrowing owl and its habitat off site, if present, shall be protected in place, and disturbance impacts shall be minimized through the use of buffer zones, visual screens, or other measures (CDFW 2012) as deemed necessary by a qualified biologist.

Mitigation for direct, permanent impacts to nesting, occupied, and satellite burrows and/or burrowing owl habitat shall be required such that the habitat acreage and number of burrows and burrowing owls impacted are replaced based on the burrowing owl life history information provided in Appendix A of the Staff Report on Burrowing Owl Mitigation (CDFW 2012), site-specific analysis, and consultation with the CDFW. A Burrowing Owl Mitigation Plan shall be prepared and submitted to the CDFW for approval prior to impacts to the burrowing owl and/or its habitat.

7.2 NESTING BIRDS

Vegetation clearing shall take place outside the general avian breeding season (which generally occurs from February through August). Tree removal/trimming shall take place outside the raptor breeding season (which generally occurs from January through August). If vegetation clearing and/or tree removal/trimming cannot occur outside the general avian and raptor breeding seasons, then a pre-construction survey for avian nesting shall be conducted by a qualified biologist within 7 calendar days prior to vegetation clearing and tree removal/trimming. If nests are not observed, work may proceed. If nests are found, work may proceed provided that construction activity is: 1) located at least 500 feet from raptor nests; 2) located at least 300 feet from listed bird species' nests; and 3) located at least 100 feet from non-listed bird species' nests. A qualified biologist shall conspicuously mark the buffer so that vegetation clearing does not encroach into the buffer until the nest is no longer active (i.e., the nestlings fledge, the nest fails, or the nest is abandoned, as determined by a qualified biologist).

7.3 INDIRECT IMPACTS

7.3.1 Fugitive Dust

Construction of the proposed Project shall adhere to fugitive dust control measures such as those included in the Antelope Valley's Air Quality Management District's Rule 403. These measures include, for example, reduced driving speeds on unpaved roads and regular watering of dirt surfaces.

7.3.2 Water Quality

While PWD has its own National Pollution Discharge Elimination System (NPDES) permit that will cover the proposed Project, in order for the NPDES permit to be relied upon, the construction contractor shall submit its own site-specific Storm Water Pollution Prevention Plan that follows PWD's NPDES permit conditions.

7.4 SIGNIFICANCE OF IMPACTS FOLLOWING MITIGATION

With successful implementation of the mitigation measures outlined in Section 7.0, all significant, or potentially significant, impacts from the proposed Project would be reduced to less-than-significant levels.

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Appendix A

MOHAVE GROUND SQUIRREL SURVEY REPORTS

TRAPPING FOR MOHAVE GROUND SQUIRRELS

for

Palmdale Water District – Palmdale Regional Groundwater Recharge and Recovery Project

July 26, 2015

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SUMMARY

The Palmdale Water District proposes to develop underground (aquifer) storage of water with ancillary components consisting of, but not limited to, recharge basins, water tanks, pipelines, buildings, and wells. An 80-acre portion of the project, that has its northwest corner located at East Avenue L Street and 100 Street East, will be devoted to recharging of water into the aquifer. This site owned by the district near Lancaster, California is presently undeveloped but significantly disturbed by human activity that includes off highway vehicles, depository for a variety of trash, and pedestrian traffic. The site is dominated by salt bush (*Atriplex* sp.) scrub and it is flat with sandy soils.

The site in question is within the range of the mohave ground squirrel (*Xerospermophilus mohavensis*) and therefore there is potential for this state listed (threatened) species, to occupy the site. A survey, therefore, for the presence or absence of this species was conducted by live trapping in March, May, and July of 2015 as prescribed by the California Department of Fish and Wildlife. Each of the three sessions consumed five days of trapping utilizing 100 Sherman live traps in a 10 X 10 grid pattern. This effort failed to discover mohave ground squirrels on the property in question.

INTRODUCTION

The purpose of this project is to store water taken from the California aqueduct in an underground aquifer for use at later dates.

The portion of the project site examined for this report is comprised of an approximately 80-acre parcel that is to be used for a recharge basin. In addition, proposed off site pipeline alignments will connect the project site to the east branch of the California Aqueduct.

The purpose of this report is solely to report the results of trapping for the presence of mohave ground squirrels. The total area that was surveyed in this study is approximately 80 acres that is to include a recharge site.

Overall Project Description

The Palmdale Water District proposes to develop a groundwater banking programs that is to recharge aquefers with imported water and potentially recycled water, as well as recovery facilities to help meet future water demands and improve reliability. The proposed project would deliver raw imported water from the East Branch of the California Aqueduct (State Water Project [SWP]) to a new recharge basin located in the City of Palmdale. The magnitude of recharge proposed may need nearly year round input. Recycled water produced locally also may be included in the recharge (compliant with applicable regulations); this source is anticipated to be available at an approximately constant rate year-round. The recharge capacity of the project is projected to be approximately 50,000 to 52,000 acre-feet per year (AF/yr).

The proposed project would occur in phases. The preliminary phase is intended to meet the District's water demands for the first 22 years of the project's life, providing a water supply of 14,125 AF/yr. The second phase is sized to meet the District's water demand through the 50-year project evaluation period (through 2067), as well as ultimate buildout, providing a water

supply of up to 24,250 AF/yr. The components of the project, which are each designed to accommodate the ultimate demand of the project, are listed below:

- **State Water Project (SWP) Turnout:** The new 50-cubic foot/second (cfs) turnout would be located at the intersection of the California Aqueduct and 106th Street East. (A turnout at the California Aqueduct is a connection/gate that allows water to leave the Aqueduct). The proposed turnout would connect to the side of the Aqueduct with a 36-inch pipe, and water would flow through the pipeline into an underground vault adjacent to the aqueduct, before traveling north to the recharge site.

- **Recharge Site:** The recharge site is 160 acres and is defined by East Avenue L to the north, East Avenue L-8 to the south, 100th Street East to the west, and 105th Street East to the east. The basins at the recharge site would consist of four 20-acre cut-and-fill earth embankment recharge basins with either soil cement or shotcrete-lined interior slopes. The basins would occupy approximately 80 acres in the center of the 160acre recharge site.

- **Raw Water Conveyance:** The SWP/pump back raw water pipeline is approximately nine miles in length and would connect the recharge site with the California Aqueduct at the proposed SWP turnout described above. The 36-inch SWP/pump back raw water pipeline would travel north along 105th Street East from the SWP turnout for approximately 2.3 miles. It would then traverse west along East Avenue S for approximately 0.1 mile, and then north along 105th Street East for approximately 1.5 miles to the terminus of 105th Street East at East Palmdale Boulevard. The SWP/pump back raw water pipeline would continue north from the intersection of 105th Street East and East Palmdale Boulevard, along the future 105th Street East alignment through undeveloped land for approximately 5.1 miles to connect with the recharge basins at the recharge site.

- **Recycled Water Conveyance:** The recycled water conveyance pipeline includes the construction of a 30-inch recycled water pipeline. The pipeline would connect to an existing 48-inch recycled water pipeline at the intersection of 105th Street East and East Avenue M. The proposed 30-inch pipeline would traverse north for approximately 0.5 mile along 105th Street East, paralleling the 36-inch SWP/ pump back raw water pipeline, until reaching the recharge site.

- **Recovery Wells:** The project would include sixteen recovery wells occurring in two phases, with all wells having a capacity of 1,200 gallons per minute (gpm). The recovery wells are intended to be phased one half at a time with eight wells installed during phase 1 and the additional eight wells installed in phase 2. The recovery wells would be configured in a radial pattern surrounding the recharge site, located on a 1.5-mile by 1.5mile square, centered around the recharge site. The wells are set back 0.5 mile on each side of the recharge site to provide more than one year of travel time, as required by the California Department of Drinking Water, for recycled water traveling from the recharge basins to the recovery wells. Piping would connect the recovery wells to the pump station. The piping for phase 1 is sized to deliver water from the wells in both phases to the recharge basin and is located either in existing or future street alignments.

- **Distribution Site:** The 1-million-gallon head tank, pump headers, and chlorination building would be located on a 2-acre parcel approximately 0.5 mile south of the recharge basins, at the intersection of Avenue M and 105th Street East.

- **Potable Water Distribution Pump Station:** The distribution system pipeline is intended to accommodate the ultimate demand. However, the pumps themselves are to be phased, meaning the four 3,000 gpm, 400-horsepower pumps (plus one additional pump as a spare) are intended to accommodate the 14,125 AF/yr demand, and the ultimate demand would be supplied through an additional two pumps of the same size and capacity. Although most phasing for the project is intended to be within two parts, this pump station is capable of being implemented through multiple phases as demand increases. The potable water distribution pump station would be located on the same 2-acre parcel as the 1-million-gallon head tank, pump headers, and chlorination building. The project would also include the installation of a 30-inch potable water pipeline that originates at the potable water pump station and proceeds south along the same alignment as the SWP/pump back raw water pipeline and then traverses west along East Palmdale Boulevard, until 60th Street East.

- **Raw Water Pump Station:** The optional raw water pump station is designed to accommodate a water banking partner or partners in order to pump back to the East Branch canal of the California Aqueduct. The raw water pump station would be located adjacent to the distribution system 1-million-gallon head tank and discharge back into the 30-inch diameter SWP/pump back raw water pipeline. It is not required for this pump station to be implemented until a water banking partnership is achieved. The raw water pump station, if constructed in the future, would be located on the same 2-acre parcel containing the 1-million-gallon head tank, pump headers, chlorination building, and potable water distribution pump station. The raw water pump station may be combined with the potable water distribution pump station, resulting in a six pump, 3,750 gpm, 600 horsepower pump station, with one additional pump as a spare.

STUDY SITE

The portion of the project site under consideration for this report is located in the Antelope Valley region of unincorporated Los Angeles County, California, east of the cities of Lancaster and Palmdale (Figure 1). It consists of 80 acres located with the northwest corner at 100 Street East and East L Street. The location surveyed by trapping extends approximately 350 meters to the east and 350 meters south of this location (Figure 2). The remainder of the property lies adjacent to the south and east of the location trapped.

The site is situated in the Littlerock quadrangle of the Unites States Geological Survey 7.5 minute map (Figure 1). This figure shows an aerial photograph of the site.

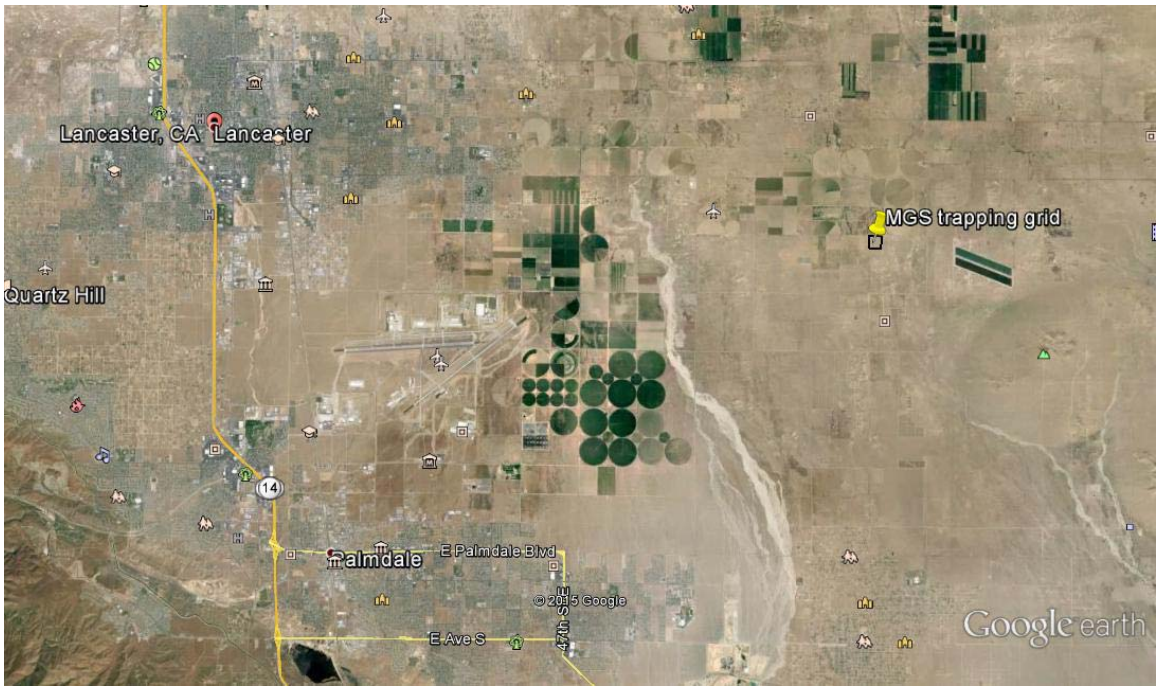

Figure 1: Location of the infiltration (trapping) site. Lancaster is to the west (left) and Palmdale to the southwest.

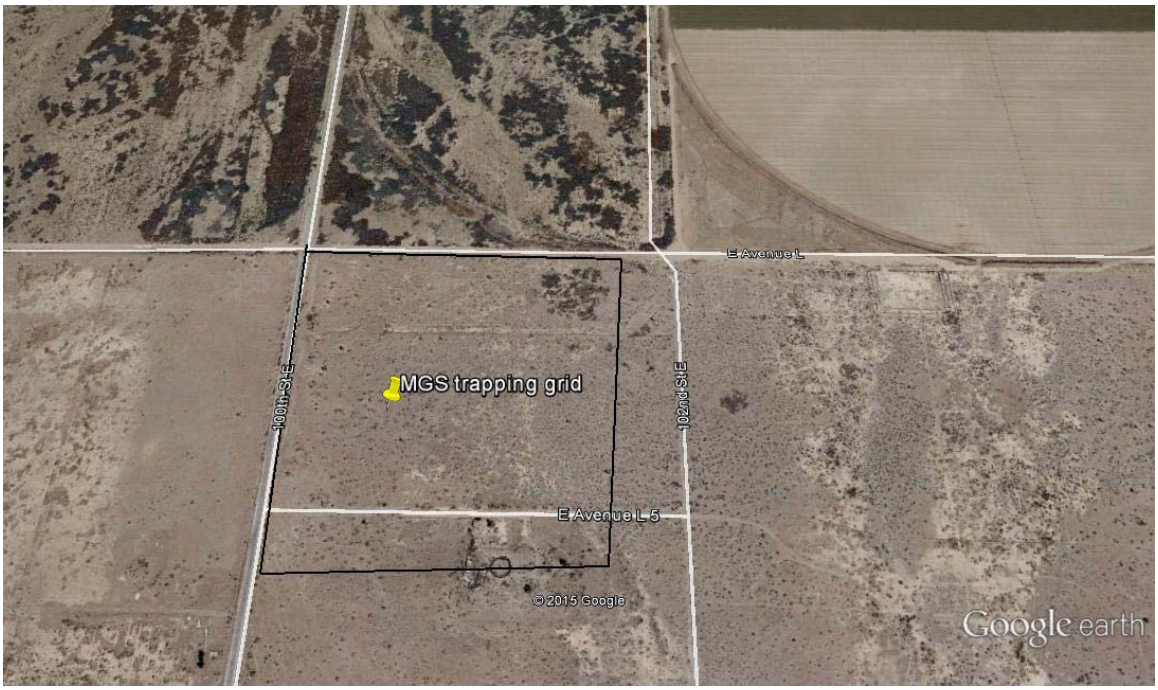

Figure 2: The study site is outlined in black (Center). The northwest corner is located at the intersection of East L Street and 100th Street East.

The site under consideration is flat with an elevation of approximately 2,525 feet above mean sea level (AMSL) throughout. It is heavily dominated by salt brush (*Atriplex* sp.) scrub with lesser components of Joshua trees (*Yucca brevicata*) and sparse annual vegetation cover.

There appears to be no drainage on the site in question but areas of presumed shallow clay pans are within the site. It offers space for a variety of uses; walking, horseback riding, off road vehicles, and it contains significant deposits of a variety of refuse. It appears to have been used for agricultural purposes in the past. There is an old homestead within the property and there are suggestions of grazing activities also in the distant past.

Immediately to the west is creosote bush and saltbush scrub and abandoned agricultural land. Saltbush scrub extends to the south with creosote bush and rabbitbrush scrub beyond. Similar habitat extends to the east of this site and to the north is irrigated agricultural land and other disturbed habitat.

METHODS

Prior to trapping the author of this report conducted a visual survey of the property for a total time of approximately three hours in order to assess the habitat and observe for mohave ground squirrels. The sky was clear and the temperature was in the mid to high 70's degrees Fahrenheit. During this time on April 14, 2015 I wondered randomly throughout the parcel and often stopped to observe and to listen. At no time did I observe or hear a mohave ground squirrel, nor did I observe any small mammals. Later in the afternoon I deployed traps arranged in a 10 x 10 grid on the designated area.

Trapping was conducted on the property in question on April 15 through April 19, 2015 for the first survey. It was also trapped on May 6, through May 10, 2015 for the second survey and again on the 3 through the 7 of July 2015.

The trapping for this project was conducted with the protocol as prescribed by the California Department of Fish and Wildlife (CDFG 2003). Traps used were clean Sherman Live Traps 3 x 3 x 12 inches and placed in a cardboard sleeve of approximately 5 x 5 x 15 inches. The sleeves served as shades. Each trap was placed on the north side of a shrub to help to provide additional shade. Traps were baited with COB (corn, oats, barley) horse feed that was mixed with peanut oil. They were replenished with bait as needed. Traps were checked at three to four hour intervals throughout the day and opened after sunrise and closing began about 1.5 hours before sundown. They were open only if the temperatures were between 50 and 90 degrees Fahrenheit and if the wind was not strong nor rain present.

The trapping arrays consisted of 100 Sherman live traps arranged in a 10 x 10 grid within the site under study. Each trap was spaced approximately 35 meters from all others in the grid array as directed by the aid of a GPS unit. Notes of observed wildlife and weather conditions were obtained and photographs of the site were taken during trapping sessions.

Figure 3. Typical placement of traps with shade covers.

RESULTS

Visual Survey:

The visual survey that was conducted on April 14, 2015 revealed no sign or signal of mohave ground squirrel. It was, therefore, determined that a trapping survey was to be conducted.

Trapping:

The Mohave ground squirrel is designated as a threatened species by the State of California. It has a limited range relative to other ground squirrels in the Mojave Desert. Its range includes the Western Mojave Desert from the Lucerne Valley area (Victorville, CA) west along the base of the San Gabriel Mountains then north to the Tehachapi Mountains and into southern Inyo County. Within its range it can occupy a variety of desert habitats including salt bush scrub, creosote bush scrub, sagebrush scrub, blackbush scrub, and Joshua tree woodland. It appears to be a generalist that includes in its diet annual grasses and forbs, the flowers, seeds, and fruits of these annuals, the seeds of Joshua trees, leaves of shrubs, and arthropods (Gustafson 1993). They may range from the desert floor up to approximately 5,000 feet in elevation. The populations of this species have been in decline for a few decades which may be a function of habitat destruction or removal due to development by agriculture, grazing pressure, industry, cities, and pursuit of recreation.

The three trapping sessions conducted as outlined in the methods section of this report produced no captures of mohave ground squirrels and few other rodents (Table 1).

During the three sessions of trapping other vertebrate species were captured and they are presented in Table 1. Table 1 also illustrates the total number of hours that traps were open per

session and the total trap days (one trap open for one day equals a trap day) per session. Other animals observed on or near the subject property are presented in Table 2.

TABLE 1: Animals Captured

First Session : April 15-19, 2015 Trap hours = 102 Trap days = 500	3 - Deer mouse -*peromyscus maniculatus*
	2 -Antelope ground squirrel – *Spermophilis leucurus*
	1 - Desert kangaroo rat – *Dipodomys desertii*
Second session: May 6-10, 2015 Trap hours = 47.5 Trap days = 500	Antelope ground squirrel – *Spermophilis leucurus*
	Desert spiny lizard – *Sceloporus magister*
	Desert kangaroo rat – *Dipodomys desertii*
Third session: July 3-7, 2015 Trap hours = 22 Trap days = 500	14 - Antelope ground squirrel – *Spermophilis leucurus*

TABLE 2: Animals Observed on the Property Under Review

Common name	Binomial
Antelope ground squirrel	*Spermophilis leucurus*
Black throated sparrow	*Amphispiza bilineata*
Brewer's blackbird	*Euphagus cyanocephalus*
Cactus wren	*Campylorhynchus brunneicapillus*
California ground squirrel	*Spermopholis becheii*
Desert kangaroo rat	*Dipodomys desertii*
Desert spiny lizard	*Sceloporus magister*
Horned lark	*Eremophila alpestrus*
Horned lizard	*Phrynosoma platyrhinos*
Le Conte's thrasher	*Taxostoma lecontei*
Mourning dove	*Zenaida macroura*
Raven	*Corvax corax*
Red shouldered hawk	*Buteo lineatus*
Sage sparrow	*Amphisiza belli*
Side blotched lizard	*Uta stansburiana*
Western kingbird	*Tyrannus verticalis*
Western whiptail	*Cnemidophorus trgris*
Western whiptail lizard	*Cnemidophorus tigris*
White crowned sparrow	*Zonotrichia leucophrys*

Table 3: Vegetation Noted on the Study Site

Common name	Binomial
Bristly fiddleneck	*Amsinkia tessellata*
Desert dandelion	*Malacothrix glabrata*
Snake's head	*Malacothrix coulteri*
Goldfileds	*Lasthenia glabrata*
Mojave suncup	*Camissonia campestris*
Stork's bill	*Erodium cicutarium*
Schismus	*Schismus* sp.
Winterfat	*Krascheninnikovia lanata*
Cryptantha	*Cryptantha* sp.
Joshua tree	*Yucca brevicata*
Saltbush	*Atriplex* sp.

DISCUSSION

The Palmdale Water District proposes to store water in subterranean aquifers near Lancaster, CA. Approximately 80 acres of disturbed desert property are slated to be developed as an aquifer recharge area for storage of water that is to be used at later dates. During the months of April, May, and July of 2015 a protocol survey for mohave ground squirrel, a listed species by the State of California, was conducted. During the survey no mohave ground squirrels were captured or otherwise detected.

The area surveyed is within the range of the mohave ground squirrel. There are three historical records of sightings in the general area. One was in 1974 about 5.7 miles south southeast of the site trapped. Two more are from 1989. One is relatively close to the 1974 sighting in that it is about 7.3 miles southeast of the study site and the other is about 8.3 miles to the south of the site. It is evident that, at least historically, the general area contained a population of mohave ground squirrels but none have been observed in the past 25 years. It may be that the population has vanished despite that fact that areas in which they were captured were, and still appears to be, relatively undisturbed. This is unlike the site under study.

The habitat on the site under investigation appears, in my opinion, poor habitat for mohave ground squirrels. Mohave ground squirrels are found in a variety of habitats of the western Mojave Desert but appear to prefer habitat with a variety of species of shrub. The area under investigation is, primarily, a monoculture of saltbush (*Atriplex* sp.) with lesser and isolated components of annual vegetation and shrubby perennials including joshua trees (*Yucca brevicat*a) and rabbit brush (*Chrysothamnus nauseosa*).

It may be that the reason for the absence of mohave ground squirrels is due to the lack of diversity of the shrub vegetation. Another suggestion is that the area under study is significantly disturbed and has been and is used as a place to deposit refuse and for agricultural purposes; past and present. The site is littered with old tires, household trash, broken bottles, appliances, construction trash, and other items often discarded in the dump. There is also evidence of use by vehicular traffic within the site and the site boundaries are surrounded by dirt and paved roads.

An additional suggestion is that prolonged drought may have influenced the small mammal population due to a lack of food resources. The usually common antelope ground squirrel is scarce and the California ground squirrel is not evident (with one exception) despite the multitude of trash piles. Reptiles also appear to be relatively scarce.

Although the absence of evidence of mohave ground squirrels via trapping methods suggests that none of this species is on the property it must be recognized that this does not offer definitive proof that this species is absent. It is reasonable to believe so, however, due to the negative results from trapping and from the paucity of other small mammals and from the abused habitat on the study site and adjacent to it. Also in support of this is that there have been no positive results for this species for over two decades.

It is my conclusion, therefore, that the project proposed will have no significant effect on the mohave ground squirrel.

LITERATURE CITED

California Department of Fish and Game (CDFG). 2003. Mohave Ground Squirrel Survey Guidelines. Sacramento, Calif. 5 pp.

Gustafson, J.R. 1993. A status review of the Mohave ground squirrel (*Spermophilus mohavensis*). Nongame Bird and Mammal Section Report 93-9. Department of Fish and Game, Wildlife Management Division. Sacramento, CA. 104 pp. + appendices.

APPENDIX 1:
Mohave Ground Squirrel (mgs)
Survey and Trapping Form

PART 1 – PROJECT INFORMATION

Project Name: Palmdale Regional Groundwater Recharge and Recovery Project

Developer: Palmdale Water District.

Location (Township, Range, Section): Los Angeles County. Township, Range, section

Quad Map/Series: 7.5 Minute Series

UTM Coordinate of Trapping Grid at NW Corner: (NAD 83, Zone 11 412795 / 3835810

Acreage of Project Site: 80 acres

Acreage of Potential MGS Habitat on Site: 80 acres

Total Acreage Visually Surveyed on Project Site: 80 acres

Date of Visual Survey: 14 March 2015

Visual Survey Conducted By: Mike McGovern

Total Acres Trapped: 40 acres

Number of Sampling Grids: 1

Trapping Conducted By: Mike McGovern

Dates of Sampling Term(s):

FIRST 15 – 19 April 2015

SECOND May 6 - 10, 2015

THIRD – July 3-7, 2015

PART II – GENERAL HABITAT DESCRIPTION

Vegetation Type: saltbust bush scrub

Dominant Perennials: salt bush (*Atriplex sp.*)

Other Perennials Joshua tree (*Yucca brevicata*),

Dominant Annuals: schismus

Other Annuals: see table 3

Land Form: alluvial plain / desert floor

Soils Description: sand

Elevation: 770 m (2525 ft)

Slope Aspect: none **Percent Slope:** <1%

APPENDIX 2: WEATHER DATA
First Session Trapping Weather Data:

04/15/15	Value	Time
Trap hours	9.5	
Air temp. min	36 F	630
Air temp. max	69 F	1430
Wind speed	Calm	AM
Wind speed	5	PM
Cloud cover	0 %	AM
Cloud cover	0 %	PM

04/16/15	Value	Time
Trap hours	10.5	
Air temp. min	40	630
Air temp. max	71	1500
Wind speed	Calm	AM
Wind speed	2 to 3	PM
Cloud cover	0.00%	AM
Cloud cover	0 %	PM

04/17/15	Value	Time
Trap hours	9.0	
Air temp. min	38 F	300
Air temp. max	81 F	1530
Wind speed	Calm	AM
Wind speed	3 to 5	PM
Cloud cover	0.00%	AM
Cloud cover	0.00%	PM

04/18/15	Value	Time
Trap hours	11.5	
Air temp. min	50	630
Air temp. max	86	1600
Wind speed	Calm	AM
Wind speed	3-5	PM
Cloud cover	0 %	AM
Cloud cover	0.00%	PM

04/19/15	Value	Time
Trap hours	11	
Air temp. min	51 F	0700
Air temp. max	86 F	1500
Wind speed	Calm	AM
Wind speed	Calm	PM
Cloud cover	0 %	AM
Cloud cover	0 %	PM

Second Session Trapping Weather Data:

05/06/15	Value	Time
Trap hours	10	
Air temp. min	64 F	0600
Air temp. max	70 F	1500
Wind speed	25	AM
Wind speed	28	PM
Cloud cover	Clear	AM
Cloud cover	Clear	PM

05/07/15	Value	Time
Trap hours	5.5	
Air temp. min	45 F	0600
Air temp. max	64 F	1130
Wind speed	25	AM
Wind speed	30	PM
Cloud cover	Clear	AM
Cloud cover	Clear	PM

05/08/15	Value	Time
Trap hours	12	
Air temp. min	39 F	0600
Air temp. max	61 F	1200
Wind speed	5	AM
Wind speed	20	PM
Cloud cover	90%	AM
Cloud cover	100%	PM

05/09/15	Value	Time
Trap hours	10	
Air temp. min	46 F	0600
Air temp. max	75 F	1600
Wind speed	5	AM
Wind speed	20	PM
Cloud cover	Clear	AM
Cloud cover	Clear	PM

05/10/15	Value	Time
Trap hours	10	
Air temp. min	48 F	0600
Air temp. max	82 F	1400
Wind speed	Calm	AM
Wind speed	5	PM
Cloud cover	Clear	AM
Cloud cover	Clear	PM

Third session trapping weather data:

07/03/15	Value	Time
Trap hours	4.5	
Air temp. min	74 F	0600
Air temp. max	90+ F	1030
Wind speed	10	AM
Wind speed	9	PM
Cloud cover	0	AM
Cloud cover	0	PM

07/04/15	Value	Time
Trap hours	4	
Air temp. min	71 F	0600
Air temp. max	90+ F	1000
Wind speed	4	AM
Wind speed	4	PM
Cloud cover	0	AM
Cloud cover	0	PM

07/05/15	Value	Time
Trap hours	4.5	
Air temp. min	71 F	0600
Air temp. max	90+ F	1030
Wind speed	10	AM
Wind speed	calm	PM
Cloud cover	0	AM
Cloud cover	0	PM

07/06/15	Value	Time
Trap hours	4.5	
Air temp. min	68 F	0600
Air temp. max	90+ F	1030
Wind speed	5	AM
Wind speed	8	PM
Cloud cover	0	AM
Cloud cover	0	PM

07/07/15	Value	Time
Trap hours	4.5	
Air temp. min	68 F	0600
Air temp. max	90+ F	1030
Wind speed	10	AM
Wind speed	8	PM
Cloud cover	0	AM
Cloud cover	0	PM

APPENDIX 3: PHOTOS OF THE SURVEY SITE

Evidence of old homestead and typical trash on site

Homestead site with trash

View from northwest corner of site looking southeast

Open areas with saltbush and minimal annual cover

Area of claypans with saltbush and sparce annual vegetation cover

Typical saltbush scrub

HABITAT ASSESSMENT FOR MOHAVE GROUND SQUIRRELS ALONG A PROPOSED PIPELINE ROUTE

for

Palmdale Water District – Palmdale Regional Groundwater Recharge and Recovery Project.

August 26, 2015

Prepared for:

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TABLE OF CONTENTS

SUMMARY

A survey of the vegetation along proposed pipeline routes for the Palmdale Water District near Palmdale, California was conducted in the morning of August 24, 2015. The survey was to assess the habitat for suitability for mohave ground squirrel along the proposed pipeline routes. The majority of the proposed routes were within desert lands that traversed through residential areas, or along existing roadways, or have been utilized in the past for agricultural pursuits and have been significantly disturbed. A small portion of the proposed routes may be considered marginally suited for mohave ground squirrels but they, too, have been significantly disturbed. It is my suggestion that if trapping or other means of detecting mohave ground squirrels along the proposed routes were to be employed that negative results would result due to inadequate habitat. The temporary disturbance of constructing the proposed pipelines will have no affect on mohave ground squirrels.

INTRODUCTION

This report addresses the habitat along proposed pipeline corridors that are associated with a proposed groundwater recharging facility for the Palmdale Water District and the proposed pump station site for the project. This report addresses only the potential for the habitat along the proposed alignments and at the pump station site to be suitable for mohave ground squirrels.

METHODS

The survey was focused primarily on the linear proposed pipeline routes. A small polygon area (pump station site) near the proposed recharge areas was also examined. Before the survey began I observed the proposed pipeline routes and pumping station area utilizing Google Earth and a map provided by Helix Environmental Planning, Inc.

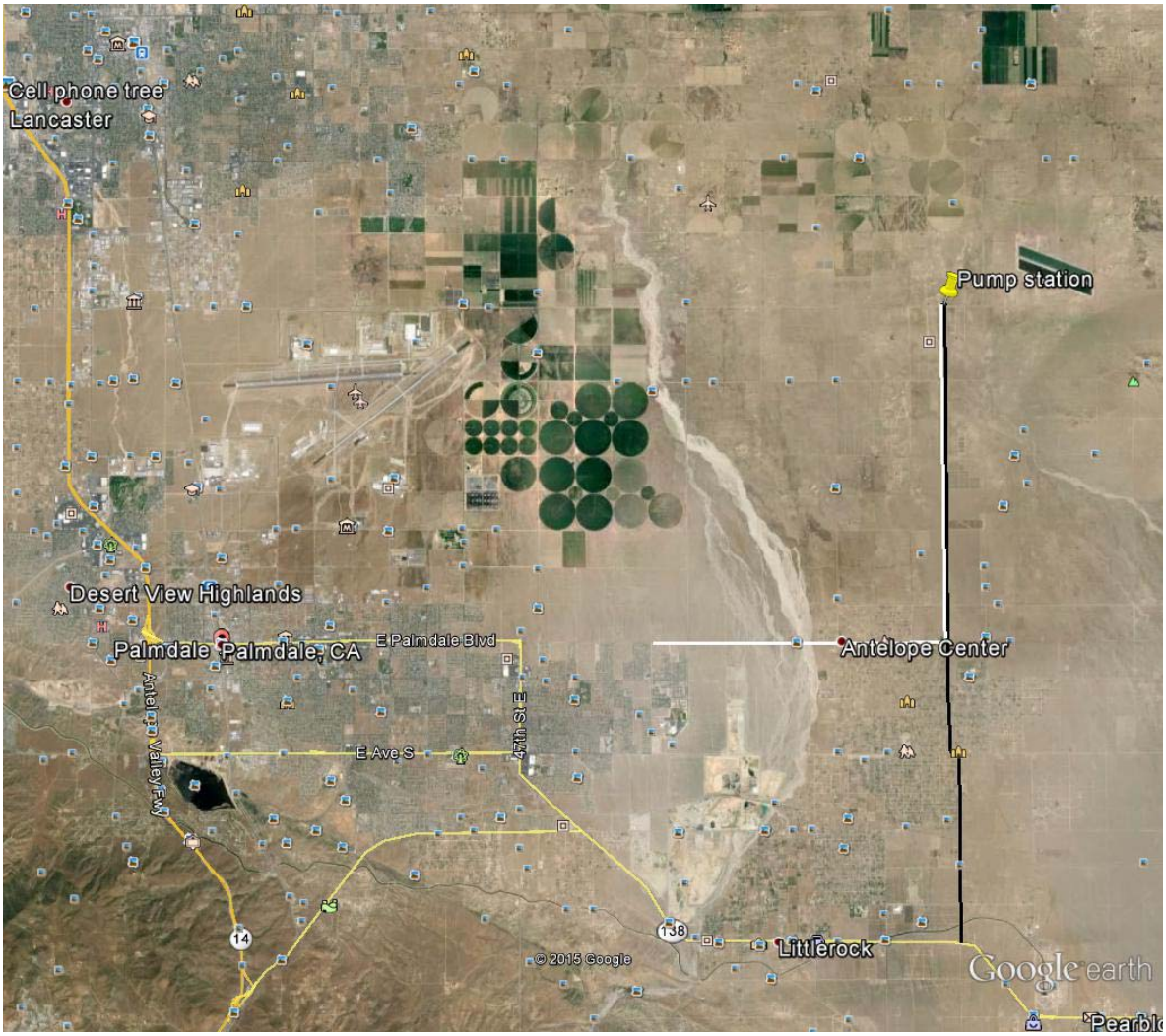
The visit to the site incorporated a walking survey of the area proposed for the pumping station. The linear aspects of the proposed project were surveyed by driving the proposed routes and stopping at various locations to inspect the vegetation and to take photographs. This was accomplished by the use of the roads that the pipelines propose to follow. In areas where there was no road I walked the proposed routes. In all incidences I took notes of the soils and vegetation and also I took photographs along the proposed alignments.

SITE DESCRIPTION

A general description of the area is that it is within the Mojave Desert east of the cities of Palmdale and Lancaster, California. It is at an elevation above mean sea level that varies from approximately 2,500 ft. in the north to 2,900 ft. in the south. The soil is sandy and the vegetation is dominated by salt bush (*Atriplex* sp.), with some areas of creosote bush (*Larrea tridentata),* rabbitbrush (*Chrysothamnus nauseosa*), and minimal numbers of Joshua trees (*Yucca brevicata*). All but about 1.25 miles of the proposed routes traverse along existing roads. Some of the roads are dirt as in the northern portion of the alignments (north of East Palmdale Blvd.) and others are paved in the southern portion of the alignments (south of and along Palmdale Blvd.) and these are within developed residential or commercial areas. The approximately 1.25 miles of proposed

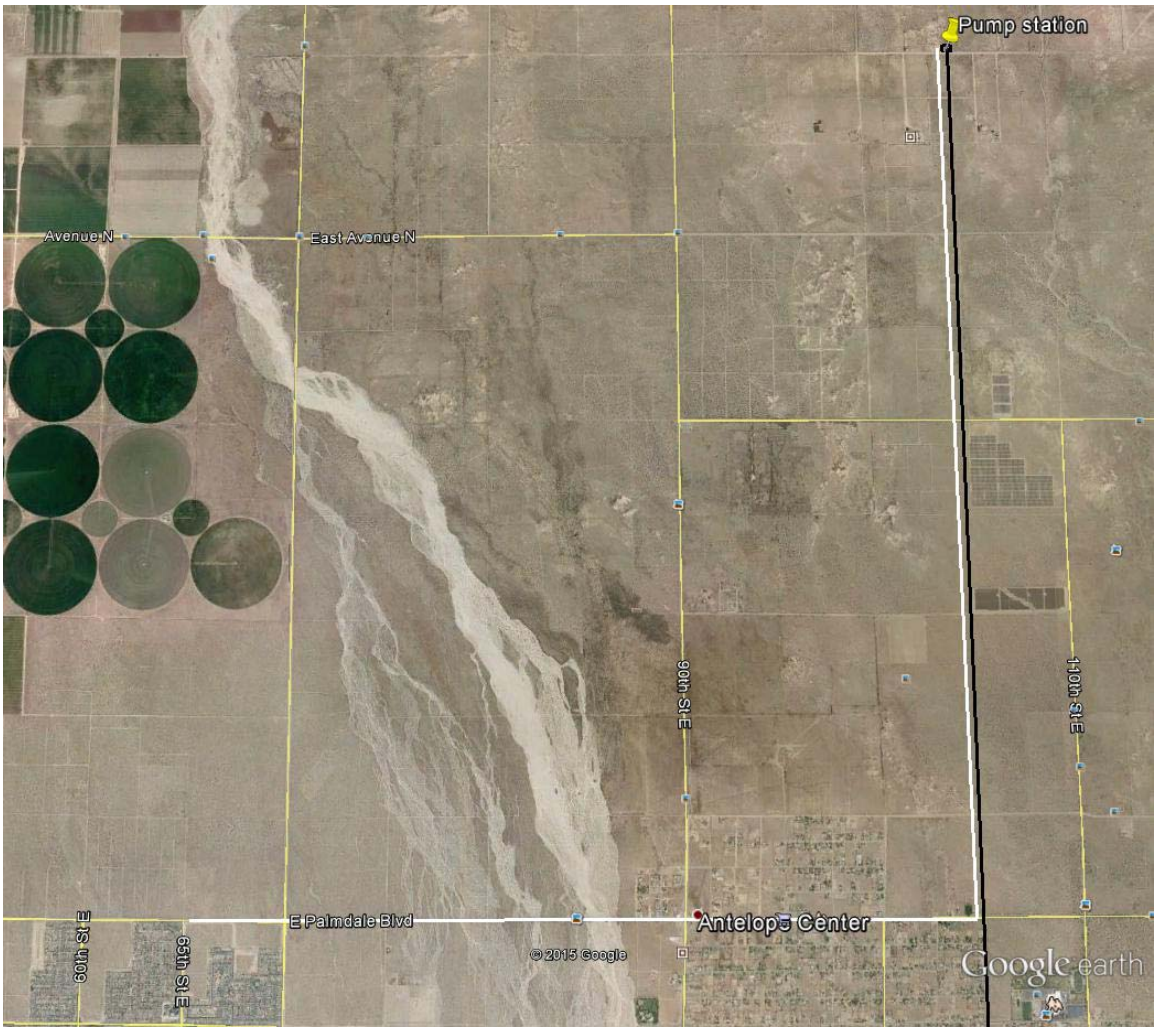
routes that do not follow a road traverse through sparsely vegetated and disturbed desert dominated by creosote bush. This section is immediately north of East Palmdale Boulevard.

The location to be dedicated to a pumping station and accompanying facilities is at the northern most location of the proposed pipeline routes. It is at the northwest corner of 105th Street East and East Avenue M and it has been utilize in the past for agricultural purposes and appears to be significantly disturbed.



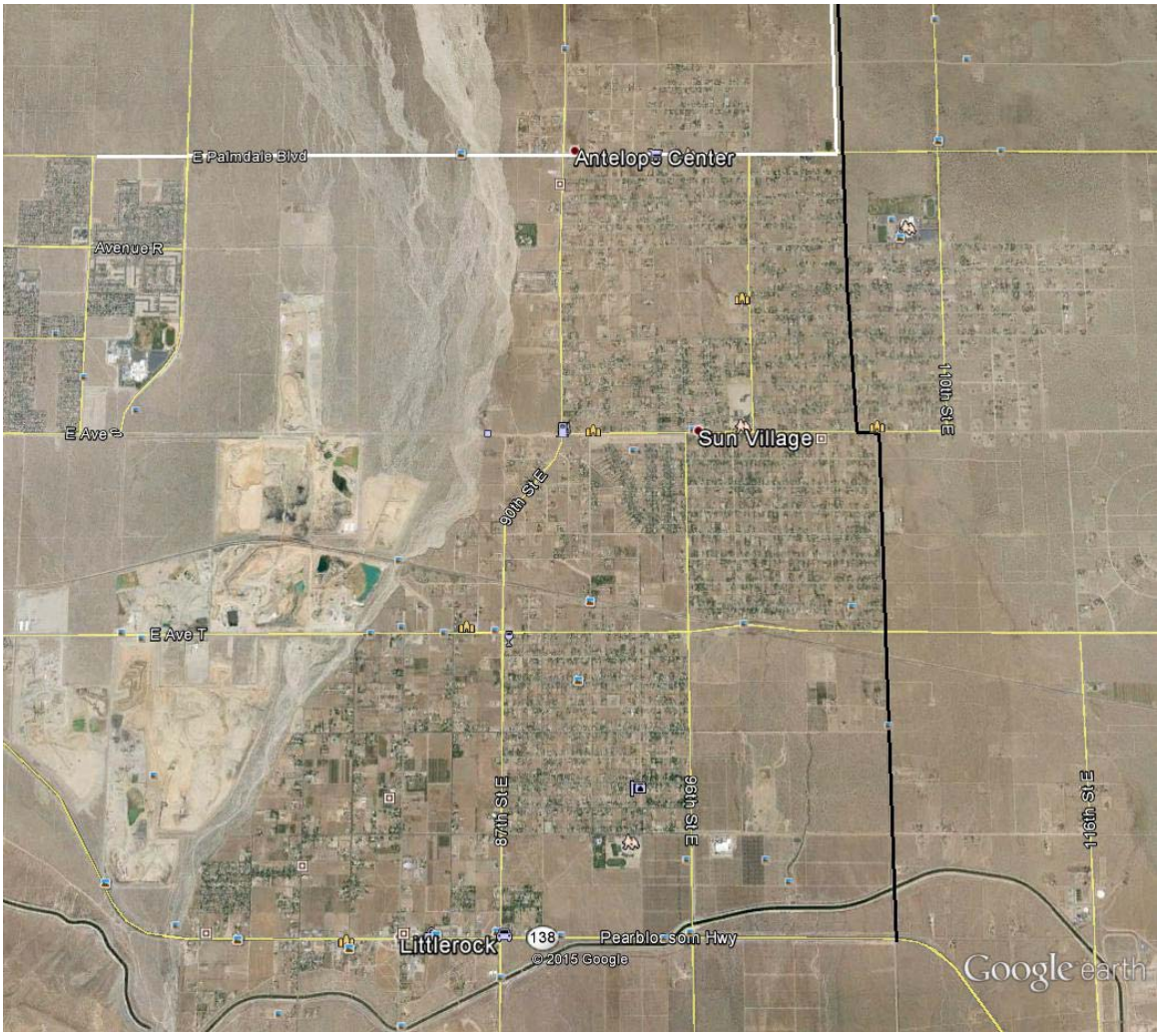
Above is an aerial map of the proposed location of the pumping station. It appears from this aerial map and from ground truthing that the adjacent land to the pumping station has been utilized for agricultural purposes. The vegetation is sparse and within the proposed station area it is almost limited to annual vegetation.

The proposed pipeline alignment is to initially follow south along 105th Street East. It is shown on the map above leading south from the pumping station location.



The aerial maps above and below show the two pipeline routes. The black line indicates one of the routes and the white line the other. The black alignment moves south along 105th Street East to East S Street where it turns east to 106th Street East and then follows 106th Street East south to the Pearblossom Highway (State Highway 138).

The white line incorporates the same route as the black line until it arrives at East Palmdale Boulevard. It then turns west to follow East Palmdale Boulevard as far as 60th street East.



RESULTS

The results of the surveys are best presented in photographs with accompanying descriptions.

Below is a photograph of the proposed site for the pumping station.

This site has minimal vegetation on it and it is surrounded by a small earth mound and an old fence suggesting that it was used for livestock in the past. The area immediately surrounding this location is dominated by salt bush and the land has been disturbed significantly in the past by what appears to be agricultural related activities.

From this location the route for two pipes heads south along 105th Street East. The route follows a sandy rural road (105th Street East) until it terminates approximately 1.25 miles north of East Palmdale Boulevard. Following are photographs of the habitat along the mentioned route.

Below is a photograph (top) of 105th Street East looking towards the south. The photograph was taken approximately 100 yards south of East M Street. Vegetation is limited to sparse, dried annual vegetation and Russian thistle (Kali tragus). This vegetation type extends approximately one half mile south from East M Street.

The following photograph was taken approximately 0.5 mile south of East M Street looking south. Vegetation is sparse and habitat for mohave ground squirrels is poor. This situation extends for approximately another 0.5 mile.

The photographs on the previous page represent the typical vegetation along the proposed pipeline routes between East N Street and East O Street. There are many areas that have been utilized for dumping trash. An old home site is with this stretch of the alignment. The dominant vegetation is salt bush with a small representation of rabbit brush and a few Joshua trees. About 0.3 mile south from East N Street a patch of creosote bush encroaches to near the road but it dissipates at about 0.5 miles south of East N Street. The habitat is primarily a monoculture of saltbush and there is evidence of significant disturbance in the past.

A significant portion of the alignment is devoted to sandy areas that appeared to support a sparse growth of annual vegetation. The photograph at the top of the previous page shows evidence of irrigation practices.

The photograph below was taken immediately to the north of East O Street looking towards the south. It indicates previous use by domestic livestock. Vegetation here is also heavily dominated by salt bush and open areas such as those in the photograph below. To the immediate south of East O Street and on the east side of 105th Street East is a solar farm. It traverses south along the east side of the alignment for about half of a mile. There is also a solar farm immediately to the east of the location from where this photograph was taken.

The photographs on the previous page were taken near East O Street. The upper photograph is looking to the north from the north side of East O Street. Vegetation is sparse to the west (left) in the photograph and saltbush dominates to the east (right).

The lower photograph was taken south of East O Street and south of the solar farm at the corner of East O Street and 105th Street East. Creosote bush is dominate for a short distance along this portion of the proposed routes. Immediately south of this small incursion of creosote bush the above photograph on this page was taken. Vegetation is void along this portion of the alignment and a solar farm is to the immediate east (left).

At this juncture 105th Street East ends temporarily. For approximately the next 1.25 miles there is no road. From this location I walked the proposed routes. The vegetation along this 1.25 miles is dominated by creosote bush with open patches of no creosote vegetation and only annual plants. These open areas are dominated by Russian thistle with evidence of other annual species and a few representations of winter fat (*Krascheninnikovia lanata*).

I emerged on East Palmdale Boulevard, a paved road. From this location the routes diverge. One heads to the west along East Palmdale Boulevard and the other continues south along 105th Street East. The southern alignment remains in residential areas as it continues south to East S Street where it jogs east to 106th Street East to continue south to the Pearblossom Highway (California Highway 138). The proposed routes remain along paved roads primarily within areas of development with the exception of the last mile of the southern route experiencing minimal residences.

Open expanses dominated by Russian thistle with creosote bush surrounding.

The creosote bush scrub along the 1.25 miles without a road.

The upper photograph on this page is typical of the route as it traverses residential areas. South of East S Street the proposed alignment has residential development on the west side and open space to the east. The open space is dominated by creosote bush. This is a typical photograph of the landscape as it continues south towards the Pearblossom Highway. At approximately one mile from the highway both sides of the alignment experience open areas that are dominated by creosote bush and interspersed with a few rural residences. The alignment, nevertheless,

continues along the paved road 106th Street East until it intersects with the Pearblossom Highway.

The proposed pipeline route that follows East Palmdale Boulevard also traverses through residential areas and some commercial areas. Along this route it experiences some lots between residences that are vacant and partially covered with salt bush as shown below.

The photograph below indicates the typical setting for the continuation of this portion of the proposed pipeline. It continues through the commercial/residential areas of unincorporated Antelope Center then crosses the Littlerock Wash before entering the residences of east Palmdale.

The following page shows a photograph of the Littlerock Wash where East Palmdale Boulevard cross it. The photograph was taken looking to the east.

Nowhere along the proposed alignments or pump station site did I observe habitat that was well suited to mohave ground squirrels.

DISCUSSION

The examination of the entire routes of the two proposed alignments and the pump station placed me almost solely into areas that have been significantly disturbed in the past or are developed. The vegetation, for the most part was a monoculture of saltbush with lesser areas of creosote bush. The creosote bush was widely spaced and offered large areas void of this bush and open to annual vegetation that appeared to be dominated by Russian thistle. There was evidence of other annual vegetation but the dried condition made it difficult to determine what it was. It may be that the areas mentioned with dried and sparse accounts of annual vegetation were a causality of a prolonged drought. I offer that in the spring on a plot near the proposed site for the pumping station there was annual blooming vegetation but it was sparse as does appear those on the observed alignments. In addition, the abundance of Russian thistle may offer competition to the native annuals. A recent, and in some areas significant, rain storm may be the reason that Russian thistle sprouts were ubiquitous but it seems that it may also offer the same to native annuals or to non-native annuals. It may also be that the native annual plants are not adapted to significant late summer rains as they are an anomaly in this part of the Mojave Desert.

The area surveyed, however, is within the range of the mohave ground squirrel. There are three historical records of sightings in the general area. One was in 1974 about 5.7 miles south southeast of the proposed pumping station site. Two more are from 1989. One is relatively close to the 1974 sighting in that it is about 7.3 miles southeast of the pumping station site and the other is about 8.3 miles to the south of the site. It is evident that, at least historically, the general

area contained a population of mohave ground squirrels but none have been observed in the past 25 years.

The habitat along the proposed pipeline alignment and pumping area appears, in my opinion, poor habitat for mohave ground squirrels. Mohave ground squirrels are found in a variety of habitats of the western Mojave Desert but seem to prefer habitat with a variety of shrub species (pers. comm. W/ Phil Leitner). The area under investigation is, primarily, a monoculture of saltbush (*Atriplex* sp.) with lesser and isolated components of annual vegetation and shrubby perennials including joshua trees (*Yucca brevicata*) and rabbit brush (*Chrysothamnus nauseosa*).

It may be that the reason for the absence of mohave ground squirrels is due to the lack of diversity of the shrub vegetation. It may be because the area under study is significantly disturbed and has been and is used as a place to deposit refuse. The site is littered with old tires, household trash, broken bottles, appliances, construction trash, and other items often discarded in the dump. There is also evidence of moderate use by vehicular traffic along the dirt roads of the proposed alignments north of East Palmdale Boulevard. An additional suggestion is that prolonged drought may have influenced the small mammal population due to a lack of food resources and thus breeding. The usually common antelope ground squirrel is scarce and the California ground squirrel is not evident despite the multitude of trash piles. Reptiles also appear to be relatively scarce. Certainly the areas of commercial and residential development will not entertain the species in question.

A trapping effort during the previous spring within a mile of the proposed pumping station site did not find mohave ground squirrels. Although the absence of evidence of mohave ground squirrels via trapping methods suggests that none of this species is on the property it must be recognized that this does not offer definitive proof that this species is absent in the area trapped. It is reasonable to believe so, however, due to the negative results from trapping from a nearby plot in the same type of habitat and from the paucity of other small mammals and from the abused habitat.

The linear project as proposed will be temporary disturbance and linear projects typically are confined within a narrow corridor. A significant portion of the proposed work will occur within developed areas and, therefore, offer no threat to habitat or wildlife. That outside of the developed areas is along an existing dirt roadway with significant disturbance adjacent to it. If the pipeline follows the roadway as suggested, the additional disturbance to the vegetation adjacent to the existing dirt road will be minimal and within poor habitat for mohave ground squirrels. There is a portion immediately north of East Palmdale Boulevard with no vehicular access. This habitat will have the most impact because of no existing road but the area is a monoculture of creosote bush within a previously disturbed area. Here the habitat is moderately improved for mohave ground squirrels but I consider it poor.

It is my conclusion, therefore, that the pipeline project proposed will have no significant effect on the mohave ground squirrel.

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HABITAT ASSESSMENT FOR MOHAVE GROUND SQUIRRELS ALONG A PROPOSED PIPELINE ROUTE, PERCOLATION PONDS, AND EXTRACTION WELLS FOR Palmdale Water District – Palmdale Regional Groundwater Recharge and Recovery Project

September 25, 2015

Prepared for:

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SUMMARY

A survey of the habitat quality for mohave ground squirrels at proposed percolation ponds and recovery well locations and the connecting pipeline routes for the Palmdale Water District near Palmdale, California was conducted in the morning of September 22, 2015. The locations surveyed were within the range of mohave ground squirrels. They were connected by existing roadways and all areas have been significantly disturbed. A small portion of the proposed pipeline route may be considered marginally suited for mohave ground squirrels but it, too, has been significantly disturbed. It is my suggestion that if trapping or other means of detecting mohave ground squirrels were to be employed that negative results would result due to inadequate or poor habitat. The development of the proposed project as addressed here will have no significant affect on mohave ground squirrels.

METHODS

The survey was focused on the linear proposed pipeline routes that connect the extraction wells to a pump station site, the five areas proposed for percolation ponds, and the proposed locations for 16 extraction wells. Before the survey began I observed the proposed pipeline routes, extraction well locations, and percolation pond areas utilizing Google Earth and maps provided by Helix Environmental Planning, Inc.

The visit to the site incorporated a walking survey of the areas proposed for the extraction wells and the percolation ponds. The linear aspects of the proposed project were surveyed by driving the proposed routes and stopping at various locations to inspect the vegetation and to take photographs. This was accomplished by the use of the roads that the pipelines propose to follow. In areas where there was no road I walked the proposed routes. In all incidences I took notes of the soils and vegetation and also I took photographs.

SITE LOCATION

The project site is located in portions of the Alpine Butte, Lancaster East, Littlerock, and Palmdale U.S. Geological Survey (USGS) 7.5-minute quadrangle maps. It is approximately 10 miles east of the cities of Palmdale and Lancaster, California (figure 1). The project consists of a recharge site and several associated pipelines and extraction wells. The recharge site is located south of East Avenue L, west of 110th Street East, north of Avenue M, and east of 95th Street. The project also includes proposed alignments for raw, potable, and recycled water supply mains that would be located mostly within existing streets. The pipelines are bounded by the recharge site to the north, the California Aqueduct to the south, 106th Street to the east, and 60th Street East to the west.

The survey conducted was restricted to a portion of the larger project site and is outlined below. It is proposed to create 16 extraction wells in two phases around a square 0.5 mile distant perimeter from the recharge basin. The perimeter has its northwest corner at the intersection of 95th St. East and East K-8 Street. Its northeast corner is at 110th Street East and East K-8 Street and the southeast corner at 110th Street East and East Avenue M. The southwest corner is at East Avenue M and 95th Street East. My survey was conducted along the roadways (pipeline corridor) that connect the mentioned corners. Sixteen extraction well sites are along the roadway and all were surveyed to an area of about 200 feet square. Five percolation pond locations were also surveyed that are adjacent to the pipeline corridor. The areas surveyed for proposed percolation pond sites 1, 2, and 5 were approximately 2.5 acres and

approximately 5.0 acres for proposed sites 3 and 4 (figure 2).

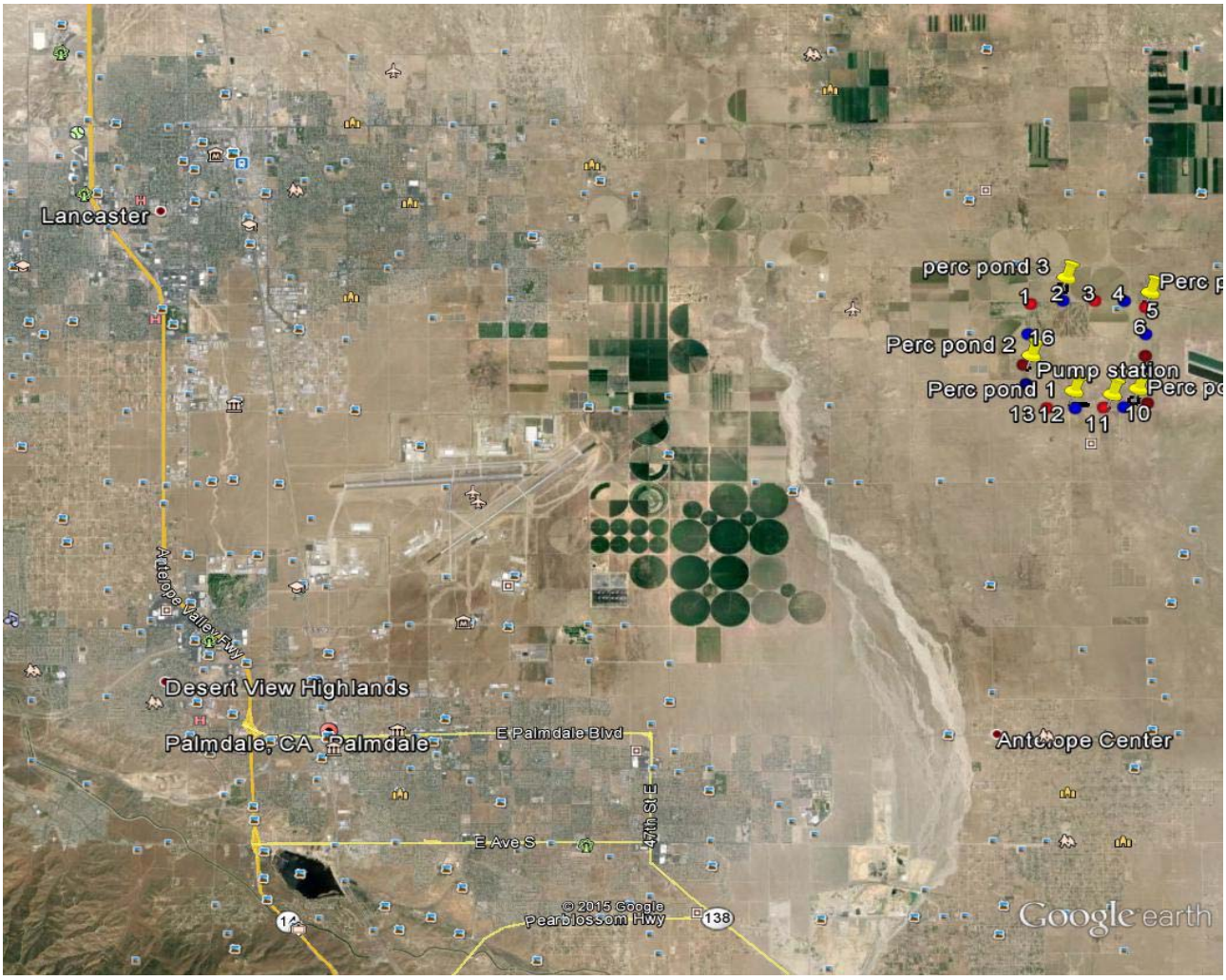

Figure 1 : Location of the site. Pump station is at the mid-southern boundary along East Avenue M.

SITE DESCRIPTION

A general description of the area is that it is within the Mojave Desert east of the cities of Palmdale and Lancaster, California. It is at an elevation above mean sea level of approximately 2500 ft. The majority of the property that was surveyed is significantly disturbed by present and past agricultural practices. Almost all areas surveyed have sparse vegetation and significant representation of invasive species, primarily Russian thistle (*Kali tragus*). There are a few areas dominated by well spaced salt bush (*Atriplex* sp.). These areas are primarily in the southeast, southcentral, and a portion of the central eastern part of the site surveyed. There are some areas dominated by creosote bush (*Larrea tridentata*) in the southwest portion of the site and rabbitbrush (*Chrysothamnus nauseosa*) is also intermixed within the sites, with most representation in the northwest. A minimal numbers of Joshua trees (*Yucca brevicata*) are inside the project but not on the sites surveyed.

PROJECT DESCRIPTION:

The Palmdale Water District plans to develop groundwater banking programs with new spreading grounds to recharge imported water and potentially recycled water, as well as recovery facilities (extraction wells) to help meet future water demands and improve reliability. The proposed project would deliver raw imported water from the East Branch of the California Aqueduct (State Water Project [SWP]) to a new recharge basin located in the City of Palmdale. For the magnitude of recharge proposed under the project, SWP water would need to be recharged nearly year round. Recycled water produced locally also may be included in the recharge (compliant with applicable regulations); this source is anticipated to be available at an approximately constant rate year-round. The recharge capacity of the project is projected to be approximately 50,000 to 52,000 acre-feet per year (AF/yr). (An acre-foot is approximately 326,000 gallons.)

The proposed project would occur in phases. The preliminary phase is intended to meet the District's water demands for the first 22 years of the project's life, providing a water supply of 14,125 AF/yr. The second phase is sized to meet the District's water demand through the 50-year project evaluation period (through 2067), as well as ultimate build out, providing a water supply of up to 24,250 AF/yr. The components of the project, which are each designed to accommodate the ultimate demand of the project, are listed below:

Specifically for this survey, the project includes sixteen recovery wells occurring in two phases, with all wells having a capacity of 1,200 gallons per minute (gpm). The recovery wells are intended to be phased one half at a time with eight wells installed during phase 1 and the additional eight wells installed in phase 2. The recovery wells would be configured in a radial pattern surrounding the recharge site, located on a 1.5 mile by 1.5 mile square, centered on the recharge site. The wells are set back 0.5 mile on each side of the recharge site to provide more than one year of travel time, as required by the California Department of Drinking Water, for recycled water traveling from the recharge basins to the recovery wells. Piping would connect the recovery wells to the pump station. The piping for phase 1 is sized to deliver water from the wells in both phases to the recharge basin and is located either in existing or future street alignments.

A pipeline is also planned to connect the extraction wells to a pumping station that is to be located at Avenue M East and East 105th Street. The pipeline will follow existing roadways. Also included in this is the water created during testing of the wells will be allowed to return to the ground. Minimal grading will be needed to create impoundments for the ponds. Figure 2 below illustrates the location of the surveys. The proposed well sites are in two different colors. Blue is for the proposed first phase and red represents the wells to be installed during the second phase. For my use only I have numbered the locations of the proposed well sites from 1 through 16 starting in the northwest (upper left) corner and numbering in sequence clockwise. Pipelines from the pump station will radiate in two directions. One will go east to incorporate wells 3 through 10. Another will branch to the west and incorporate wells 11 through 2. The pipelines will follow the roads that are shown on the figure. The percolation ponds are also shown.

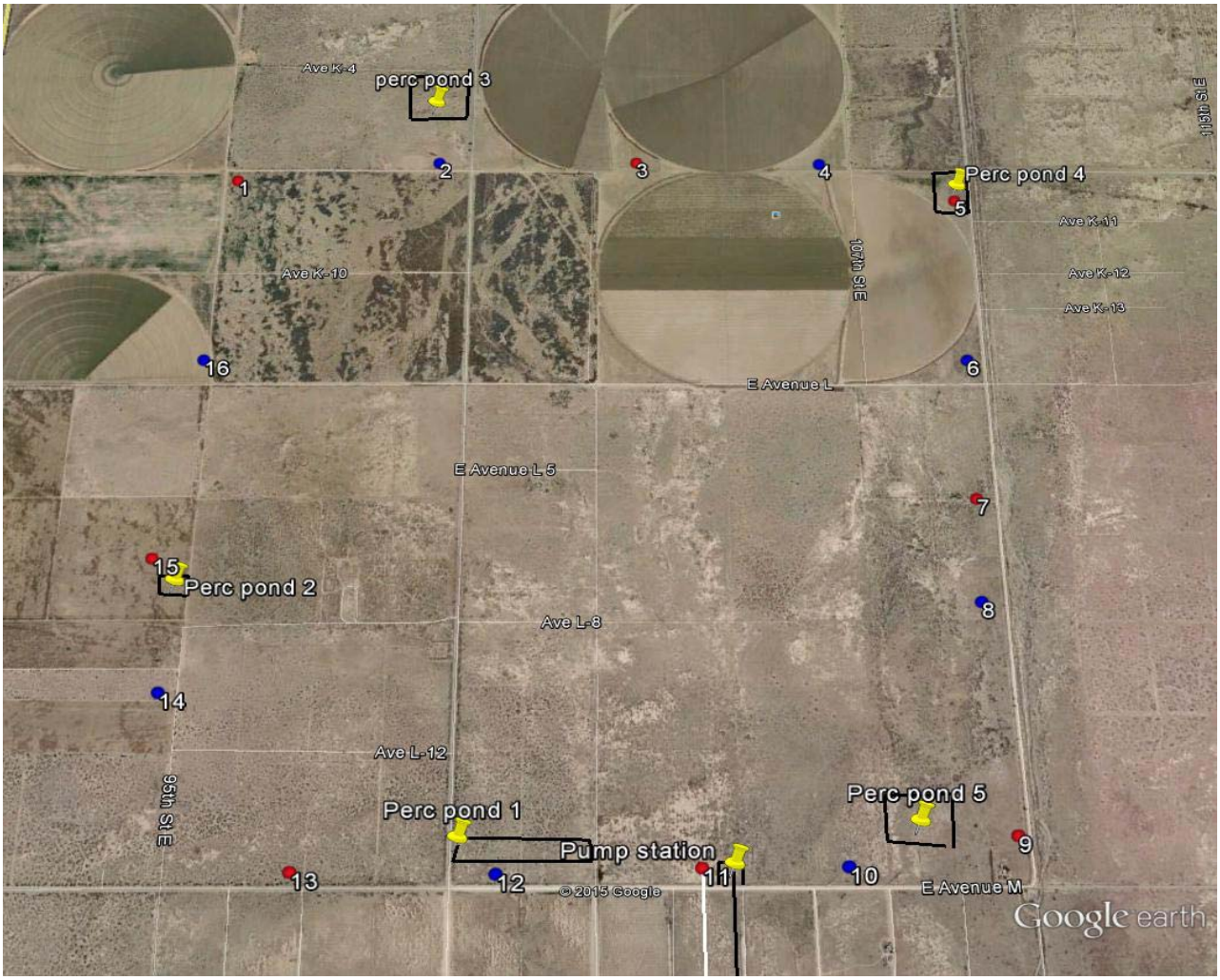

Figure 2: Location of the proposed well sites (1-16) and the percolation ponds (perc pond). Blue dots are phase one and red dots represent phase 2. The wells are arbitrarily numbered by the author starting from the northwest (top left) corner and moving sequentially clockwise.

RESULTS

PIPELINE ALLIGNMENT

The pipelines that will connect the extraction wells will follow existing roadways. The roadways appear to be well traveled and significantly disturbed along the north, east, and southern sides of the survey. This is due to local traffic and to traffic from agricultural activities. Also significant growth of Russian thistle is present in almost all locations. Less traffic appeared along the western side of the project along East 95th Street. In the northern portion of this street traffic has significantly disturbed the roadway but towards the distant southern portion the street becomes a sinuous path through creosote bushes for about 300 feet before encountering East Avenue M. This area appears to lend itself to those who choose to dispose of trash. Along the road from proposed extraction well 14 and south to East Avenue M the area is reasonably well vegetated with creosote bush scrub. North of well 14 the land is highly disturbed and void of vegetation in many places due to farming practices.

Looking south along 95th St. East near well 1. Vegetation along road is Russian thistle to right and rabbit brush to left

East 95th Street at extraction well 15

Much of the remainder of the roadways looks similar to the first photograph above. The roads are wide, bare, and skirted by significant stands of Russian thistle. In some areas the road is paved as it is along East Avenue M west of 100th Street East. The remainder (to the east) of East Avenue M is wide and appears often trafficked. 110th Street East is well traveled and Avenue K-8 has many places where the areas adjacent to the roadway are void of vegetation or the only vegetation is Russian thistle.

PERCOLATION PONDS

Five percolation ponds are proposed. Approximately 1000 cubic yards of soil will be move at each well site. About 750 cubic yards will be used to raise each well site approximately two feet. The remainder of the soil will be utilized at a percolation pond. Two well sites will utilize a percolation pond thus adding about 500 cubic yards to each pond site.

The sites chosen for the percolation ponds are all in highly disturbed areas. Four of them (sites 2 through 5) have minimal to no shrubby vegetation. Only site one has minimal habitat (although poor). I include a photograph of proposed percolation pond site one below along with additional sites.

It is my opinion that there is no appropriate habitat for mohave ground squirrels on any of the proposed sites for percolation ponds.


Site of perc pond 1


Site of perc pond 5

EXTRACTION WELLS

The development of the extraction wells will incorporate the temporary disturbance of areas of approximately 200 feet square. The permanent structure associated with the well will comprise of much less permanently disturbed area. The extraction wells are also on sites that offer no appropriate habitat for mohave ground squirrels. Many are in areas that have no vegetation or minimal vegetation that is heavily comprised of Russian thistle.

The examples below are typical of the sites chosen for extraction wells. The first seven photographs are good representations of all the well sites except for the last two shown (sites 7 and 13). Well site 7 is in saltbush scrub that is stunted and well spaced. It is poor habitat but it has more vegetation than all other sites except for well site 13. Well site 13 has the most cover and vegetation of all the sites and it is marginally adequate for mohave ground squirrels. While walking through this area I observed white tail antelope ground squirrels. This area was the only place along my surveys that I observed ground squirrels. It is, however, in an area where trash is dumped and there is vehicular disturbance nearby.


Well site 2


Well site 4


Well site 9


Well site 8


Well site 11


Well site 14


Well site 7


Well site 13

DISCUSSION

The larger aspect of the groundwater recharge project is primarily planned upon land that has been significantly disturbed by past and present agricultural practices. Essentially every acre of the sites proposed in this study has been affected adversely. Nothing appears to be in its pristine state within the areas chosen for the extraction wells, pipeline corridors, or the percolation ponds. There are small areas that are primarily in the southwestern portion of the observed sites that offer minimal habitat that could be utilized by mohave ground squirrels. The area referred has creosote bush scrub but it, too, is disturbed. The creosote bush was widely spaced and offered large areas void of this bush and open to annual vegetation that appeared to be dominated entirely by Russian thistle. In this marginal habitat there is planned only an extraction well. Disturbance, therefore, should be minimal and most of it temporary. There was evidence of other annual vegetation but the dried condition made it difficult to determine what it was. It may be that the areas mentioned with dried and spare accounts of annual vegetation were a causality of a prolonged drought. But I offer that in the spring on a plot near the proposed site for the pumping station there was annual blooming vegetation but it was sparse similar to those on the observed alignments, ponds, and extraction sites. In addition, the abundance of Russian thistle may offer competition to the native annuals. Two months ago in some areas a significant rain storm may be the reason that Russian thistle sprouts were ubiquitous but it seems that it may also offer the same to native annuals or other non native annuals. It may also be that the native annual plants are not adapted to significant late summer rains as they are an anomaly in this part of the Mojave Desert.

The area surveyed, however, is within the range of the mohave ground squirrel. There are three historical records of sightings in the general area. One was in 1974 about 5.7 miles south southeast of the site trapped. Two more are from 1989. One is relatively close to the 1974 sighting in that it is about 7.3 miles southeast of the study site and the other is about 8.3 miles to the south of the site. It is evident that, at least historically, the general area contained a population of mohave ground squirrels but none have been observed in the past 25 years.

The habitat along the proposed pipeline alignment and pump area appear, in my opinion, poor habitat for mohave ground squirrels. Mohave ground squirrels are found in a variety of habitats of the western Mojave Desert but appear to prefer habitat with a variety of shrub species. The areas under investigation are, primarily, a monoculture of sparse saltbush (*Atriplex* sp.) or creosote bush (*Larrea tridentata*) with lesser and isolated components of annual vegetation and shrubby perennials including joshua trees (*Yucca brevicata*) and rabbit brush (*Chrysothamnus nauseosa*).

It may be that the reason for the absence of mohave ground squirrels is due to the lack of diversity of the shrub vegetation. It may be because the area under study is significantly disturbed and has been and is used as a place to deposit refuse. Many areas are littered with old tires, household trash, broken bottles, appliances, construction trash, and other items often discarded in the dump. There is also evidence of moderate use by vehicular traffic along the dirt roads of the proposed alignments. An additional suggestion is that prolonged drought may have influenced the small mammal population due to a lack of food resources and thus breeding. The usually common antelope ground squirrel is scarce and the California ground squirrel is not evident despite the multitude of trash piles. Reptiles also appear to be relatively scarce.

A trapping effort during the previous spring within the confines of the survey area did not find mohave ground squirrels. Although the absence of evidence of mohave ground squirrels via trapping methods

suggests that none of this species is on the property it must be recognized that this does not offer definitive proof that this species is absent in the area trapped. It is reasonable to believe so, however, due to the negative results from trapping, poor habitat, from the paucity of other small mammals and from the abused habitat. All of the proposed work will occur within significantly disturbed areas and within poor habitat.

It is my conclusion, therefore, that the pipeline project proposed, the construction of percolation ponds, and the creation of extraction wells will have no significant affect on the mohave ground squirrel.

Appendix B

ANIMALS SPECIES OBSERVED OR DETECTED

Appendix B
ANIMAL SPECIES OBSERVED OR DETECTED

ORDER/FAMILY	SCIENTIFIC NAME	COMMON NAME
INVERTEBRATES		
Hymenoptera		
Formicidae	*Linepithema humile*	Argentine ant
VERTEBRATES		
Reptiles		
Squamata		
Phrynosomatidae	*Phrynosoma platyrhinos*	horned lizard
	Sceloporus magister	desert spiny lizard
	Uta stansburiana elegans	western side-blotched lizard
Teiidae	*Cnemidophorus tigris*	western whiptail lizard
Viperidae	*Crotalus scutulatus*	Mojave rattlesnake
Birds		
Accipitriformes		
Accipitridae	*Buteo jamaicensis*	red-tailed hawk
	Buteo lineatus	red-shouldered hawk
	*Circus cyaneus**	northern harrier
Caprimulgiformes		
Caprimulgidae	*Chordeiles acutipennis*	lesser nighthawk
Columbiformes		
Columbidae	*Zenaida macroura*	mourning dove
	Zenaida asiatica	white-winged dove
Falconiformes		
Falconidae	*Falco sparverius*	American kestrel
Passeriformes		
Alaudidae	*Eremophila alpestris actia**	California horned lark
Corvidae	*Corvus brachyrhynchos*	American crow
	Corvus corax	common raven
Emberizidae	*Amphisiza belli*	sage sparrow
	Amphispiza bilineata	black throated sparrow
	Passerculus sandwichensis	savannah sparrow
	Zonotrichia leucophrys	white-crowned sparrow

Appendix B (cont.)
ANIMAL SPECIES OBSERVED OR DETECTED

ORDER/FAMILY	SCIENTIFIC NAME	COMMON NAME
VERTEBRATES (cont.)		
Birds (cont.)		
Hirundinidae	*Stelgidopteryx serripennis*	northern rough-winged swallow
Icteridae	*Euphagus cyanocephalus*	Brewer's blackbird
	Sturnella neglecta	western meadowlark
Laniidae	*Lanius ludovicianus**	loggerhead shrike
Mimidae	*Mimus polyglottos*	northern mockingbird
	*Taxostoma lecontei**	Le Conte's thrasher
Parulidae	*Cardellina pusilla*	Wilson's warbler
Passeridae	*Passer domesticus*	house sparrow
Polioptilidae	*Polioptila melanura*	black-tailed gnatcatcher
Strigidae	*Athene cunicularia**	burrowing owl
Troglodytidae	*Campylorhynchus brunneicapilus*	cactus wren
Tyrannidae	*Sayornis saya*	Say's phoebe
	Tyrannus verticalis	western kingbird
Strigiformes		
Strigidae	*Bubo virginianus*	great horned owl
Mammals		
Carnivora		
Canidae	*Canis latrans*	coyote (scat)
Lagomorpha		
Leporidae	*Lepus californicus*	black-tailed jack rabbit
Rodentia		
Cricetidae	*Peromyscus maniculatus*	deer mouse
Heteromyidae	*Dipodomys desertii*	desert kangaroo rat
Sciuridae	*Otospermopholis beecheyi*	California ground squirrel
	Ammospermophilis leucurus	antelope ground squirrel

*Sensitive Species

Appendix C

PLANTS SPECIES OBSERVED

Appendix C
PLANT SPECIES OBSERVED

FAMILY	SCIENTIFIC NAME	COMMON NAME	HABITAT**
Agavaceae	*Yucca brevifolia*	Joshua tree	MMWS, MDWS
Alliaceae	*Allium haematochiton*	red-skinned onion	MMWS
Apocynaceae	*Asclepias erosa*	desert milkweed	MCBS
Asteraceae	*Ambrosia acanthicarpa*	annual bursage	MDWS, DH
	Ambrosia dumosa	burro weed	MCBS, MCBS-d, MDWS
	Ambrosia salsola	burrobrush	MCBS, MCBS-d
	Anisocoma acaulis	scale bud	MCBS, MMWS
	Ericameria nauseosa	rubber rabbitbrush	DSBS, DSBS-d
	Geraea canescens	desert sunflower	MDWS
	Gutierrezia microcephala	threadleaf snakeweed	MCBS
	Helianthus annuus	common sunflower	MDWS, DH
	Lasthenia gracilis	needle goldfields	MCBS, MMWS
	Lepidospartum squamatum	California broomsage	MDWS
	Leptosyne bigelovii	Bigelow coreopsis	MCBS
	Lessingia glandulifera	valley lessingia	DSBS, DSBS-d
	Malacothrix coulteri	snake's head	MCBS
	Malacothrix glabrata	desert dandelion	MCBS, MMWS
	Nicolletia occidentalis	Mojave hole-in-the-sand plant	MCBS
	Senecio flaccidus	shrubby ragwort	MCBS, MMWS
	Stephanomeria pauciflora	desert straw	MDWS
	Stephanomeria virgata	tall stephanomeria	DH
Boraginaceae	*Amsinckia tessellata*	bristly fiddleneck	MCBS, MMWS
	Cryptantha sp.	cyptantha	MCBS
	Heliotropium curassavicum	seaside heliotrope	MDWS
	Pectocarya heterocarpa	chuckwalla combseed	MCBS
	Tiquilia nuttallii	Nuttall's crinklemat	MDWS
	Tiquilia plicata	plicate coldenia	MDWS
Brassicaceae	*Brassica nigra**	black mustard	DH, NNG
	Descurainia pinnata	yellow tansy mustard	MCBS
	*Descurainia sophia**	herb sophia	DH, NNG
	*Sisymbrium altissimum**	tall tumble mustard	DSBS-d

Appendix C (cont.)
PLANT SPECIES OBSERVED

FAMILY	SCIENTIFIC NAME	COMMON NAME	HABITAT**
Caryophyllaceae	*Achyronychia cooperi*	frost-mat	MDWS
	Loeflingia squarrosa	spreading loeflingia	MCBS, MMWS
Chenopodiaceae	*Atriplex canescens* ssp. *canescens*	shad scale	DSBS, DSBS-d
	Atriplex polycarpa	allscale	MDWS, DSBS, DSBS-d
	*Chenopodium album**	lambsquarters	DH
	Chenopodium incanum var. *occidentale*	mealy goosefoot	MDWS
	Krascheninnikovia lanata	winterfat	MCBS
	*Salsola paulsenii**	barbwire Russian thistle	DSBS-d
	*Salsola tragus**	Russian thistle	DSBS-d
Euphorbiaceae	*Croton californicus*	California croton	MDWS
	*Euphorbia wallichii**	Wallich spurge	DH
	Stillingia linearifolia	narrow leaved stillingia	MCBS
Fabaceae	*Astragalus lentiginosus* var. *variabilis*	dapplepod locoweed	MDWS
Geraniaceae	*Erodium botrys**	long-beaked filaree	DH, NNG
	*Erodium cicutarium**	red-stem stork's bill	DH, NNG
Laminaceae	*Monardella exilis*	Mojave monardella	MCBS
	Scutellaria mexicana	Mexican bladdersage	MDWS, DSBS
Loasaceae	*Mentzelia* sp.	blazingstar	MDWS, DSBS
	Petalonyx thurberi	Thurber's sandpaper plant	MDWS
Malvaceae	*Eremalche exilis*	white mallow	MCBS
Nyctaginaceae	*Abronia pogonantha*.	Mojave sand verbena	MCBS
Onagraceae	*Camissonia campestris*	Mojave suncup	MCBS, MMWS, MDWS
	Camissoniopsis pallida spp. *pallida*	pale sun cup	MCBS, MMWS
	Eremothera boothii spp. *desertorum*	Booth's sun cup	MCBS, MDWS
	Oenothera californica	California primrose	MMWS
	Oenothera deltoides ssp. *deltoides*	birdcage evening primrose	MCBS, MMWS
Poaceae	*Arundo donax**	giant cane	DH
	*Bromus madritensis**	red brome	DH, NNG
	*Bromus tectorum**	cheatgrass	MCBS-d, MMWS-d

Appendix C (cont.)
PLANT SPECIES OBSERVED

FAMILY	SCIENTIFIC NAME	COMMON NAME	HABITAT**
Poaceae (cont.)	*Festuca perennis**	Italian ryegrass	DH, NNG
	*Hordeum murinum**	foxtail barley	DH, NNG
	Oryzopsis hymenoides	Indian ricegrass	MCBS, MMWS
	*Schismus barbatus**	Mediterranean grass	MCBS-d, MMWS-d
Polemoniaceae	*Allophyllum glutinosum*	sticky false gilyflower	MMWS
	Gilia brecciarum ssp. *brecciarum*	Nevada gilia	MCBS, MMWS, MDWS
Polygonaceae	*Eriogonum angulosum*	anglestem buckwheat	MMWS
	Eriogonum brachyanthum	yellow buckwheat	MCBS, MMWS
	Eriogonum pusillum	yellow turbans	MCBS, MMWS
	Eriogonum thurberi	Thurber's buckwheat	MCBS, MMWS
	Rumex hymenosepalus	canaigre dock	MCBS, MMWS
Solanaceae	*Datura wrightii*	sacred thorn-apple	MDWS
	Lycium sp.	desert thorn	MMWS
Zygophyllaceae	*Larrea tridentata*	creosote bush	MCBS, MCBS-d, DSBS, DSBS-d

* Non-native Species
** MCBS = Mojave creosote bush scrub
MCBS-d = Mojave creosote bush scrub-disturbed
MMWS = Mojave mixed woody scrub (not in the impact area but in the 50-meter survey buffer surrounding it)
MMWS-d = Mojave mixed woody scrub-disturbed (not in the impact area but in the 50-meter survey buffer surrounding it)
MDWS = Mojave desert wash scrub (not in the impact area but in the 50-meter survey buffer surrounding it)
DSBS = Desert salt bush scrub
DSBS-d = Desert salt bush scrub-disturbed
NNG = Non-native grassland
DH = Disturbed habitat

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Appendix D

SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR

Appendix D SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR			
Species	**Status[1]** **Federal** **State** **CNPS**	**Habitats and Bloom Period**	**Potential to Occur[2]**
Alkali mariposa lily (*Calochortus striatus*)	-- -- CNPS 1B.2	Alkaline, mesic chaparral, chenopod scrub, Mohave desert scrub, meadows, seeps. Perennial bulbiferous herb that blooms April to June.	Low. Potential habitat in the impact area is limited.
Peirson's morning-glory (*Calystegia peirsonii*)	-- -- CNPS 4.2	Chaparral, chenopod scrub, cismontane woodland, coastal scrub, lower montane coniferous forest, valley and foothill grassland. Perennial rhizomatous herb that blooms April to June.	Low. The only potential habitat in the impact area is non-native grassland, and it is very limited in extent.
White pygmy-poppy (*Canbya candida*)	-- -- CNPS 4.2	Gravelly, sandy, granitic soils in Joshua tree woodland, Mojave desert scrub, pinyon and juniper woodland. Annual herb that blooms March to June.	Low. Potential habitat in the impact area is limited.
Mojave paintbrush (*Castilleja plagiotoma*)	-- -- CNPS 4.3	Found in dry sagebrush scrub and pinyon woodland habitats of the Mojave Desert. Perennial herb that blooms April to June.	None. There is no potential habitat in the impact area.
Mojave spineflower (*Chorizanthe spinosa*)	-- -- CNPS 4.2	Chenopod scrub, Joshua tree woodland, Mojavean desert scrub, and playas—sometimes in alkaline soils. Annual herb that blooms March to July.	Low. Potential habitat in the impact area is limited.

Appendix D (cont.)
SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR

Species	Status[1] Federal State CNPS	Habitats and Bloom Period	Potential to Occur[2]
Sagebrush loeflinga (*Loeflingia squarrosa* var. *artemisiarum*)	-- -- CNPS 2B.2	Sandy dunes and sandy/ gravelly flats, disturbed areas, in Great Basin sagebrush scrub, and Mojave desert scrub. Occurs in exposed areas with full sun. Annual herb that blooms April to May.	Low. Potential habitat in the impact area is limited.
Short-joint beavertail (*Opuntia basilaris* var. *brachyclada*)	-- -- CNPS 1B.2	Chaparral, Joshua tree woodland, Mojave desert scrub, pinyon and juniper woodland. Perennial stem succulent that blooms April to August.	None. A perennial stem succulent that would have been observed if present.
Lemmon's syntrichopappus (*Syntrichopappus lemmonii*)	-- -- CNPS 4.3	Sandy or gravelly chaparral, Joshua tree woodland, and pinyon/juniper woodland. Annual herb that blooms from April to June.	None. There is no potential habitat in the impact area.

[1] See Appendix F for an explanation of status codes.
[2] Species are considered to have potential to occur when: 1) they were reported to the CNDDB within or near the Project; and/or 2) were included in the CNPS Inventory of Rare and Endangered Plants for the Alpine Butte, Lancaster East, Littlerock, or Palmdale USGS Quadrangles.

Appendix E

SENSITIVE ANIMAL SPECIES OBSERVED/DETECTED OR WITH POTENTIAL TO OCCUR

Appendix E
SENSITIVE ANIMAL SPECIES OBSERVED/DETECTED OR WITH POTENTIAL TO OCCUR

Species	Status[1] Federal State	Habitats	Potential to Occur[2]
Reptiles			
Desert tortoise (*Gopherus agassizii*)	FT ST	Occupies a variety of habitats from flats and slopes dominated by creosote bush scrub at lower elevations to rocky slopes in blackbrush and juniper woodland ecotones at higher elevations. Throughout most of the Mojave Desert, occurs most commonly on gently sloping terrain with sandy-gravel soils and where there is sparse cover of low-growing shrubs. Soils must be friable for digging burrows but firm enough so that they do not collapse (USFWS 2011b).	No desert tortoise or desert tortoise sign was observed during the 2015 survey.
Coast horned lizard (*Phrynosoma blainvillii*)	-- SSC	Inhabits open areas of sandy soil in grasslands, coniferous forests, woodlands, and chaparral. Often found along sandy washes with scattered shrubs and along dirt roads.	Moderate potential to occur.
Birds			
Burrowing owl (*Athene cunicularia*)	BCC SSC	Primarily a grassland species but persists and may thrive in some landscapes highly altered by human activity. The primary elements of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only occasional, sparsely located shrubs and taller vegetation (Shuford et al. 2008).	The burrowing owl and an occupied burrow (a concrete pipe in the ground) were along the potable water and raw water/return water pipelines in 2015. Other, similar concrete pipes were found in the immediate vicinity that may be connected to the occupied pipe and form a burrow complex. Additionally, burrows with potential to support the burrowing owl were found in other locations in the proposed Project impact area, primarily on the Recharge Site.
Ferruginous hawk (*Buteo regalis*)	BCC WL	Grasslands and agricultural regions in southern California from mid-September to early April. Does not breed in southern California.	Low to moderate potential to forage in the impact area.

Appendix E (cont.)
SENSITIVE ANIMAL SPECIES OBSERVED/DETECTED OR WITH POTENTIAL TO OCCUR

Species	Status[1] Federal State	Habitats	Potential to Occur[2]
Birds (cont.)			
Swainson's hawk (*Buteo swainsoni*)	BCC ST, SSC	Common to rare breeders in California; breeding populations occur in desert, shrubsteppe, grassland, and agricultural lands. Majority of known territories located in the Central Valley and Great Basin. Migrates between breeding territories in North America and wintering area in southern South America (Woodbridge 1998).	Low potential to migrate through and forage. Not expected to nest.
Mountain plover (*Charadrius montanus*)	BCC SSC	Open, sparsely vegetated habitats. Does not breed in California.	Recorded annually in fall and winter in the agricultural lands east of Lancaster (McGaugh in *BLM* 2005). Low potential to occur in the impact area as agricultural land is limited.
Northern harrier (*Circus cyaneus*)	-- SSC	Found in wide open habitats, primarily scattered throughout lowlands but can also be observed in foothills, mountains, and desert.	One northern harrier was observed flying over the Recharge Site in 2015.
California horned lark (*Eremophila alpestris actia*)	-- WL	Coastal strand, grasslands, and desert scrub.	Observed in 2015 in the impact area along the 30" and 36" pipelines.
Prairie falcon (*Falco mexicanus*)	BCC WL	Nesting occurs on cliff or bluff ledges or occasionally in old hawk or raven nests; foraging occurs in grassland or desert habitats.	Moderate potential to forage in the impact area. No nesting habitat is present, however.
Loggerhead shrike (*Lanius ludovicianus*)	BCC SSC	Occurs in grassland, open sage scrub, chaparral, and desert scrub habitats.	Observed in 2015 along the well pipeline southeast of the Recharge Site.
Le Conte's thrasher (*Toxostoma lecontei*)	-- SSC	Prefers open desert with scattered shrubs and sandy and/or alkaline soils. Known to occur in the Antelope Valley. Rarely found in riparian vegetation or on agricultural lands (Weigand and Fitton 2008).	Observed in 2015 in the southwest corner of the Recharge Site.

Appendix E (cont.)
SENSITIVE ANIMAL SPECIES OBSERVED/DETECTED OR WITH POTENTIAL TO OCCUR

Species	Status[1] Federal State	Habitats	Potential to Occur[2]
Mammals			
Mohave ground squirrel (*Xerospermophilus mohavensis*)	-- ST	Endemic to the western part of the Mojave Desert in portions of Inyo, Kern, Los Angeles, and San Bernardino counties. Occurs in a wide variety of habitats including Mojave creosote bush scrub, Mojave mixed woody scrub, desert saltbush scrub, blackbrush scrub, Mojave desert wash scrub, Joshua-tree woodland, and shadscale scrub. Mojave creosote bush scrub is the preferred habitat. The Mohave ground squirrel has also been found in some areas used for agriculture (USFWS 2011c).	Not expected due to negative trapping survey results and poor habitat quality throughout the proposed Project.

[1] See Appendix F for an explanation of status codes.
[2] Species are considered to have potential to occur when: (1) they were reported to the CNDDB within or near the Project (locations are not always specific); and/or (2) were included in the USFWS database for the area; and/or (3) potentially suitable habitat is present.

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Appendix F

EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES

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U.S. Fish and Wildlife Service (USFWS)

FE Federally listed endangered

FT Federally listed threatened

BCC Bird of Conservation Concern—Represents USFWS' highest conservation priorities and draw attention to species in need of conservation action.

California Department of Fish and Wildlife (CDFW)

SE State listed endangered

SR State listed rare

ST State listed threatened

SSC State species of special concern—Declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.

WL Watch list—Birds that are/were: a) not on the current list of species of special concern but were on previous lists and have not been State listed under the California Endangered Species Act; b) previously State or federally listed and now are on neither list; or c) on the list of "Fully Protected" species.

FP Fully Protected refers to all vertebrate and invertebrate taxa of concern to the California Natural Diversity Data Base regardless of legal or protection status. These species may not be taken or possessed without a permit from the Fish and Game Commission and/or CDFW.

California Native Plant Society (CNPS)

California Rare Plant Rank

1A = Presumed extirpated in California and either rare or extinct elsewhere.

1B = Rare, threatened, or endangered in California and elsewhere.

2A= Presumed extirpated in California but more common elsewhere.

2B= Rare, threatened, or endangered in California but more common elsewhere.

3 = More information is needed.

4 = A watch list for species of limited distribution.

Threat Rank

.1 = Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)

.2 = Moderately endangered in California (20 to 80 percent occurrences threatened/moderate degree and immediacy of threat)

.3 = Not very threatened in California (less than 20 percent of occurrences threatened/ low degree and immediacy of threat or no current threats known)